1997 Index for *Missouri Epidemiologist*

KEY

J/F97 = January/February 1997
M/A97 = March/April 1997
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Tuberculosis Hospital Discharge Study

Lynelle Phillips, R.N., M.P.H.
Vic Tomlinson, M.P.A.
Shannon Pierce
Bureau of Tuberculosis Control

Cindy Weinbaum, M.D.
Centers for Disease Control and Prevention

H. Denny Donnell, Jr., M.D., M.P.H.
Office of Epidemiology

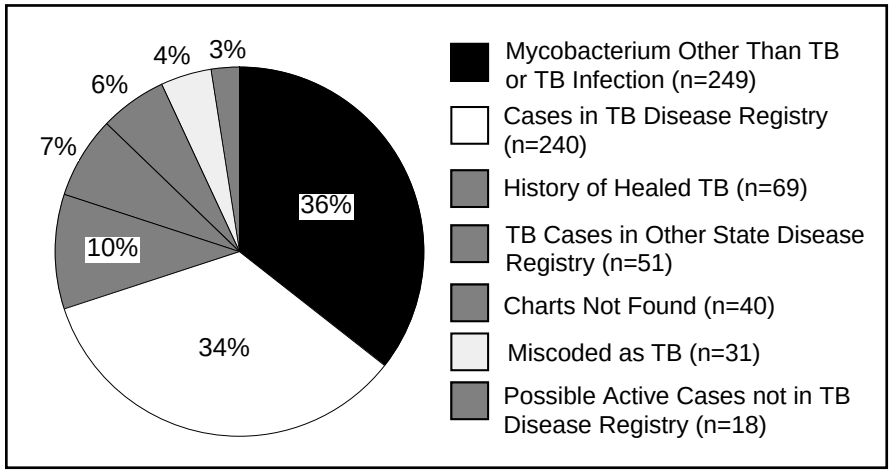

Figure 1. Results of tuberculosis hospital discharge study, Missouri, 1995–96.

Tuberculosis (TB) has been a reportable disease in Missouri since the early part of this century. The Bureau of Tuberculosis Control maintains reports of verified TB disease and infection in a computerized registry. Prior to this study there was no measure of the completeness of reporting of TB in Missouri. The widespread use of the state TB labora–tory at Mt. Vernon and informal cross checking with reported STD and HIV/AIDS disease reporting led staff to estimate completeness at well over 90 percent. Recently, bureau staff, in conjunction with the Division of TB Elimination at the Centers for Disease Control and Prevention (CDC), utilized the statewide hospital discharge database to evaluate:

- The TB disease reporting rate of Missouri's hospitalized patients, and
- The predictive value of hospital discharge data for disease case finding.

Analysis of the hospital discharge billing records coded with TB-related diagnoses (ICD-9) between January 1995 and June 1996 yielded 866 medical records. One hundred and sixty eight of these were duplicate records. The remaining 698 records were cross-matched with the TB registry, resulting in 240 matches. An additional 300 matches were found using the TB infection registry, the state TB laboratory database and neighboring state registries. The matching process also involved reviewing and abstracting data from 258 medical records. Figure 1 illustrates the results.

There were 18 cases remaining that, based on available information, could not be ruled out as TB disease, and were not found in the TB registry. Only one case was confirmed by a positive culture; therefore, the presumptive diagnosis was based on the clinical evidence alone in most cases. See sidebar on page 2 for the criteria for reporting TB cases.

Based on these findings, and assuming all 18 cases were unreported, active TB disease cases, the sensitivity of the Missouri TB disease surveillance system is 93 percent (240/[240+18]) for patients discharged with a diagnosis of TB. The predictive value positive (PVP) of the discharge database, which measures whether or not a patient had confirmed TB disease when discharged with an

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ICD-9 code of TB, was also calculated. The PVP was 36 percent ([240+51+18/866]). Excluding duplicate records, the PVP increases to 44 percent ([240+51+18/698]).

The results of this study reflect well on the reporting record of Missouri's hospitals. Staff at the Department of Health appreciate the cooperation of all the hospitals in evaluating the registry, and encourage continued reporting of suspected TB cases in accordance with state mandates. Department and CDC staff will continue investigating the 18 remaining cases to determine if they were active TB disease cases and the reasons they may not have been reported or included in the registry. The department continues to cross check registry data with the HIV/AIDS registries, state laboratory data and pharmacy records to assure maximal reporting.

Discharge data had a low predictive value positive for finding cases of active TB (36%). An ICD-9 code of TB at discharge included many patients that did not have TB disease. Patients with a past history of TB, TB infection and suspected TB (that was ruled out later) also had the same discharge diagnosis. This non-specific coding primarily accounted for the low PVP. See Figure 1.

Most patients were discharged before the TB diagnosis was confirmed or ruled out, necessitating assistance from the state TB laboratory (which tests 85 percent of TB cases in Missouri). Because of the possibility of culture-negative clinical cases of TB, laboratory data alone were often not sufficient to rule out a case. There is no requirement to retain records on ruled-out suspect TB cases in local health agencies since the patient no longer has a reportable disease. This complicated the process of tracing a patient's clinical course, because the potential case may well have been reported and tracked before being ruled out, after which the records were discarded. For these reasons, the 93 percent reporting sensitivity calculated for Missouri's TB registry is probably an underestimate.

This was a very labor intensive investigation. It required 258 medical record reviews and cooperation from numerous hospitals and their infection control nurses, three Department of Health TB nurses, two CDC physicians and coordination with the rest of the TB Bureau staff over several months.

A complete and accurate surveillance system is key to controlling TB. We hope hospital staff maintain their excellent record for reporting all suspect TB cases to the Department of Health so Missouri may reach it's goal of TB elimination by the year 2010.

ACKNOWLEDGEMENTS: This project would not have been a success without the assistance from the bureau's southeastern and southwestern district nurses, Lynn Tennison, R.N. and Becky Hutchings, R.N. Special thanks for their thoroughness, timeliness and attention to detail in retrieving information on patients. The bureau also thanks the Center for Health Information Management and Epidemiology staff for providing the hospital discharge data that made this project possible and the staff at CDC, especially Dr. Eileen Schneider.

Criteria for Reporting TB Cases

All 50 states, the District of Columbia, New York City, United States dependencies and possessions, and independent nations in free association with the United States* report TB cases to the federal Centers for Disease Control and Prevention (CDC) based on certain criteria. All cases that meet the criteria, called **verified TB cases**, are counted each year.

Cases that meet **one** of these three sets of criteria are counted as verified TB cases:

1. The patient has a positive culture for *M. tuberculosis*

or

2. The patient has a positive smear for AFB, but a culture has not been done or cannot be done

or

3. The patient has a positive tuberculin skin test reaction, has other signs and symptoms of TB disease, is being treated with two or more TB drugs, and has been given a complete diagnostic evaluation.

In addition, cases that do not meet any of these sets of criteria (for example, a patient who is anergic and has a negative culture for *M. tuberculosis* but who has signs and symptoms of TB disease) may be counted as a verified TB case if a health care provider has reported the case and decided to treat the patient for TB disease.

* The dependencies, possessions, and independent nations include Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, the Republic of the Marshall Islands, the Commonwealth of the Northern Mariana Islands, and the Federated States of Micronesia.

Funding for Alternatives to Abortion

Kay Strom, R.N.C., B.S.N.
Bureau of Family Health

In Missouri, there are about 14,000 abortions per year. Over the last several years, the state of Missouri has begun an investment in family planning, a primary prevention program that has reduced the number of unwanted pregnancies and increased the safe interval between pregnancies. During fiscal year 1995-96, the Department of Health received requests for twice the number of family planning payments than we had available resources. All of these additional requests came from Missouri health care providers giving care to uninsured women. When family planning services are not available to women because of cost, there will be some women who have an unplanned pregnancy. This can become a very significant crisis in the life of the affected woman and her family.

In the spring of 1996, the Missouri legislature added $900,000 of general revenue resources to the Department of Health budget for the purpose of providing alternatives to abortion services for pregnant women and those in the post-pregnancy period. This funding was limited to be used only by local health agencies and hospitals. To determine the best use of these funds, the Department of Health initiated a two-month evaluation process that included a complete literature review on abortion and alternatives to abortion and meetings with pro-life advocates, pro-choice advocates and a group of local health agencies and hospitals. The department also engaged in a planning process to link this funding to other existing department funding, including family planning services, pregnancy testing services, TEL-LINK information HELP line, abstinence education programs, breast and cervical cancer screening, and sexually transmitted disease programs. It also considered services not available to women on Medicaid. After these activities, the department elected to take the following three approaches for fiscal year 1996-97 to reach the shared goal of reducing abortions in Missouri.

The first approach involves an in-depth evaluation of adoption as an alternative to abortion. A contract with the Jackson County Health Department includes: an investigation regarding legal, social and educational barriers to adoption in our state; a literature review; a comprehensive, objective written description of the barriers and the steps necessary to successfully complete the adoption process in Missouri; the development of a pamphlet and poster promoting adoption; a plan for pamphlet and poster distribution; and a supply of 100,000 pamphlets and 200 posters. A public discussion including leaders from the executive and legislative branches should then be held regarding breaking down these barriers. The contract award is $73,000.

The second approach is to build on the recognition that many women seek repeated pregnancy tests as a way to reach for help. Some pregnancy tests are bought from stores; others are obtained in health clinics. In most health clinics, the resources are frequently not available to provide the kind of counseling for both positive and negative pregnancy tests that are required by many high-risk women. While pregnancy testing funding will be used from another source, $100,000 has been contracted to the Sinclair School of Nursing at the University of Missouri-Columbia to teach nondirectional, comprehensive pregnancy testing counseling throughout the state. Nurses and social workers will be trained to assist women with negative pregnancy tests in choosing appropriate family planning methods and developing life goals. Nondirectional counseling will be provided to women with positive pregnancy tests. A brochure describing women's options will be developed through this contract. The brochure could then be available both at the site of pregnancy testing and health clinics, as well as made available in a rack near store-bought pregnancy tests. In our literature review, it was clear that there are many reasons that women choose a particular outcome at the time of a positive pregnancy test. Professional, comprehensive information with follow-up services will assist in making the most appropriate decision.

The third approach is the most comprehensive. We believe that only through collaboration of the multiple resources available to women in communities can crises be resolved effectively. The repeat abortion rate is a statistic that both pro-life and pro-choice forces agree should be reduced. For the period 1992–94, the rate of repeat abortions in Kansas City and St. Louis ranged from 36.5 percent to 49.9 percent. In women who choose to have more than one abortion during their reproductive years, the most frequent causes for the unwanted pregnancy were not using contraception, failure to use contraception appropriately, or multiple social problems. Collaboration between local health agencies, hospitals, family planning and abortion facilities, and alternative services providers is essential to reducing the rate of repeat abortions. St. Louis City and Kansas City health departments have contracted for $350,000 each to create consortia of collaborating providers. The goal of these consortia will be to identify women at every step in the process from family planning to pregnancy testing, to abortion and post-abortion, as well as women choosing adoption and those keeping their children. At every step, women must know that support is there for them to choose the decision that most positively affects their lives. Women must know that if they choose to continue their pregnancies, support services are available. If they choose to terminate their pregnancies, they must know that this can be avoided in the future. The Department of Health believes that when

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Hepatitis A in Southwestern Missouri

Bureau of Communicable Disease Control

The southwestern area of Missouri has been experiencing a community-wide outbreak of hepatitis A (HAV) since the beginning of 1996. A total of 543 cases occurred during the first 11 months of 1996, which is an increase of 438 percent over the same period in 1995 when 101 cases of HAV occurred. The largest number of cases, 116, occurred in October. See Figure 1. The distribution of cases during this 11 month period was 42 percent female and 58 percent male, for a ratio of 1:1.38. Distribution of cases by county is shown in Table 1.

Usually the highest rates of HAV are among children ages 5–14 years. In southwestern Missouri during the first 11 months of 1996, 13 percent of the cases were in the 5–14 year age group. In contrast, 57 percent of the cases were in the 20–39 year age group. See Figure 2. The mean and median ages during this time period were both 28.

Close personal contact with a case of HAV is the greatest risk factor for the spread of this disease. Thirty three percent of the reported cases in southwestern Missouri during January to November 1996, reported close contact with another known case of HAV. Working in, or attending a child care center, appeared to be low risk for acquiring HAV, with only five percent of the cases associated with this type of exposure (national figures cite 15 percent).

Approximately 13 percent of the reported cases in southwestern Missouri during the first 11 months of 1996 have admitted to using street drugs. An informal survey of the local health agencies indicate they believe that drug usage is highly under-reported by the case patients. Close person-to-person contact during drug usage is thought to be the source of infection in outbreaks among injecting

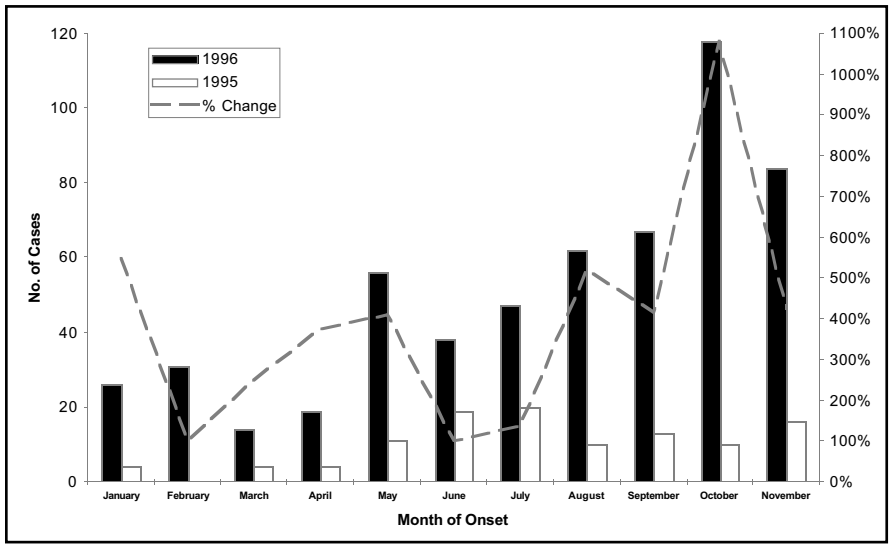

Figure 1. Number of hepatitis A cases by month of onset, Southwestern Health District, January–November 1996.

Table 1. Number of Hepatitis A Cases by County, Southwestern Health District, January–November 1995 and 1996

County	Jan–Nov 1995 Frequency	Jan–Nov 1995 % of Total	Jan–Nov 1996 Frequency	Jan–Nov 1996 % of Total
Barry	0	0.0%	21	3.9%
Barton	1	1.0%	3	0.6%
Bates	2	2.0%	1	0.2%
Benton	21	20.8%	11	2.0%
Cedar	4	4.0%	4	0.7%
Christian	3	3.0%	42	7.7%
Dade	1	1.0%	2	0.4%
Dallas	1	1.0%	16	2.9%
Greene	10	9.9%	124	22.8%
Henry	21	20.8%	7	1.3%
Hickory	1	1.0%	2	0.4%
Jasper	6	5.9%	91	16.8%
Lawrence	0	0.0%	25	4.6%
McDonald	3	3.0%	25	4.6%
Newton	2	2.0%	101	18.6%
Polk	2	2.0%	20	3.7%
St. Clair	2	2.0%	1	0.2%
Stone	1	1.0%	6	1.1%
Taney	0	0.0%	25	4.6%
Vernon	18	17.8%	6	1.1%
Webster	2	2.0%	10	1.8%
Total	**101**	**100.0%**	**543**	**100.0%**

and non-injecting drug users, although contaminated drugs may also play a role in disease transmission. Although the viremic period is short, exchanging needles and syringes could also spread the virus.

When hepatitis A is diagnosed in a food service worker, there is concern because of the possibility of exposure to a large number of patrons. Circumstances surrounding each case of hepatitis A in a food service worker are closely examined to determine the probability that HAV may have been transmitted to patrons. Guidelines issued by the Centers for Disease Control and Prevention (CDC) are used to determine associated risks and whether or not immune globulin (IG) is indicated for certain patrons who may have been exposed to HAV. These criteria are as follows:

- Types of foods the infected person handled, and how the foods were handled, and
- Hygienic practices of the infected person, and whether or not the person had diarrhea while working, and
- Whether or not patrons can be identified and treated with IG within two weeks of exposure.

During the first 11 months of 1996 in southwestern Missouri, 39 food service workers were diagnosed with hepatitis A (seven percent of the total number of cases). During this same time period, there were five public announcements alerting patrons of restaurants in southwestern Missouri to obtain IG (two in Taney County, one each in Benton, Greene and Newton counties). To date, health officials have been unable to link any of the other 504 cases of HAV in the district to an establishment where the infected workers were employed.

Several steps can be taken to curtail the spread of HAV, including:

1. Exclude HAV positive cases from high-risk occupations (food service,

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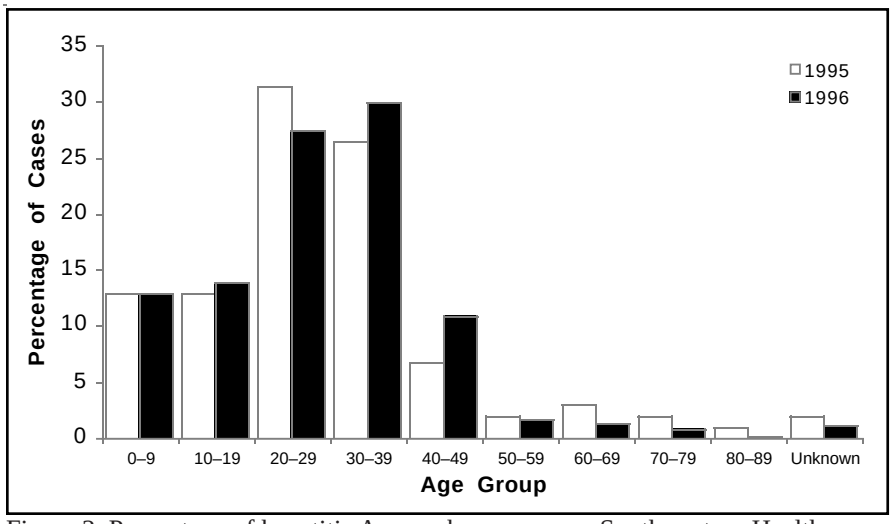

Figure 2. Percentage of hepatitis A cases by age group, Southwestern Health District, January–November 1995 and 1996.

Hepatitis A (HAV)

Cause: hepatitis A, one of the picornaviruses.

Symptoms: fever, malaise, anorexia, nausea, abdominal discomfort, jaundice.

Incubation period: 15 to 50 days; average 28 to 30 days.

Transmission: fecal-oral route through person-to-person contact; ingestion of contaminated food or water. Viremia occurs during the prodromal phase and HAV has been transmitted on rare occasions by transfusion.

Diagnosis: demonstration of IgM antibodies against hepatitis A virus (IgM anti-HAV) in serum of acutely or recently ill persons. IgM anti-HAV may remain detectable for 4–6 months after onset. The presence of total anti-HAV indicates the person has had HAV, but doesn't indicate if the infection is current or past.

Prevention:

- **Good sanitation and personal hygiene**
- **Proper immunization for travelers** to HAV endemic areas (IG or vaccine)
- **Proper cooking** of seafood from contaminated waters
- **Immune Globulin (IG)** is greater than 85% effective in preventing HAV when given within 2 weeks following exposure to HAV. Confers immunity for up to 3 months.
- **HAV vaccine** is inactivated and highly immunogenic; given in 2 or 3-dose series. (Two vaccines currently available; produced by SmithKline Beecham and Merck)

For more information regarding hepatitis A, immune globulin, or the vaccine, call the Bureau of Communicable Disease Control at (800) 392-0272.

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child care, caring for patients in hospitals and long term care facilities) until noninfectious.

2. Destroy potentially contaminated foods that will not be cooked further.

3. Maintain good handwashing and personal hygienic practices.

4. Use sanitary practices during food preparation.

5. Provide IG to high-risk contacts in a timely manner.

6. Promote the use of HAV vaccine.

In southwestern Missouri, the local health agencies and the Department of Health's Southwestern District Health Office are committed to curtailing this community-wide outbreak of HAV. Numerous educational programs have been presented to food service workers and other interested parties. Several local health agencies have incorporated HAV vaccination as a part of their services to persons employed in the food industry. Webster County Health Department initiated the practice, and others soon followed, including: Benton County Health Department, Branson City Health Department, Christian County Health Department, Dallas County Health Department, Hickory County Health Department, Joplin City Health Department, Polk County Health Department, St. Clair County Health Department and Springfield-Greene County Public Health Center. The local health agency purchases and administers the vaccine, and the food service establishment reimburses the health agency for the cost.

HAV vaccine will provide protection in children over 2 years of age and adults and is recommended for persons at increased risk of HAV infection, as well as for any person wishing to obtain immunity. The Advisory Committee on Immunization Practices (ACIP) identifies populations at increased risk for

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State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Sept 96	Oct 96	Total YTD
Specimens Tested	10,302	11,030	103,304
Initial (percent)	63.5%	63.4%	65,135
Repeat (percent)	36.5%	36.6%	38,169
Specimens: Unsatisfactory	151	186	1,581
HT Borderline	1,216	1,354	13,126
HT Presumptive	30	25	598
PKU Borderline	3	2	51
PKU Presumptive Positive	0	2	9
GAL Borderline	55	49	988
GAL Presumptive Positive	1	5	19
FAS (Sickle cell trait)	77	76	768
FAC (Hb C trait)	31	29	246
FAX (Hb variant)	14	11	135
FS (Sickle cell disease)	3	4	20
FSC (Sickle C disease)	0	0	8
FC (Hb C disease)	0	0	2

	Nov 96	Dec 96	Total YTD
Specimens Tested	8,681	10,262	122,247
Initial (percent)	63.3%	65.6%	77,356
Repeat (percent)	36.7%	34.4%	44,891
Specimens: Unsatisfactory	155	159	1,895
HT Borderline	895	1,292	15,313
HT Presumptive	25	44	667
PKU Borderline	0	1	52
PKU Presumptive Positive	1	0	10
GAL Borderline	47	48	1,083
GAL Presumptive Positive	2	3	24
FAS (Sickle cell trait)	70	90	928
FAC (Hb C trait)	20	21	287
FAX (Hb variant)	13	11	159
FS (Sickle cell disease)	1	2	23
FSC (Sickle C disease)	2	1	11
FC (Hb C disease)	0	0	2

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

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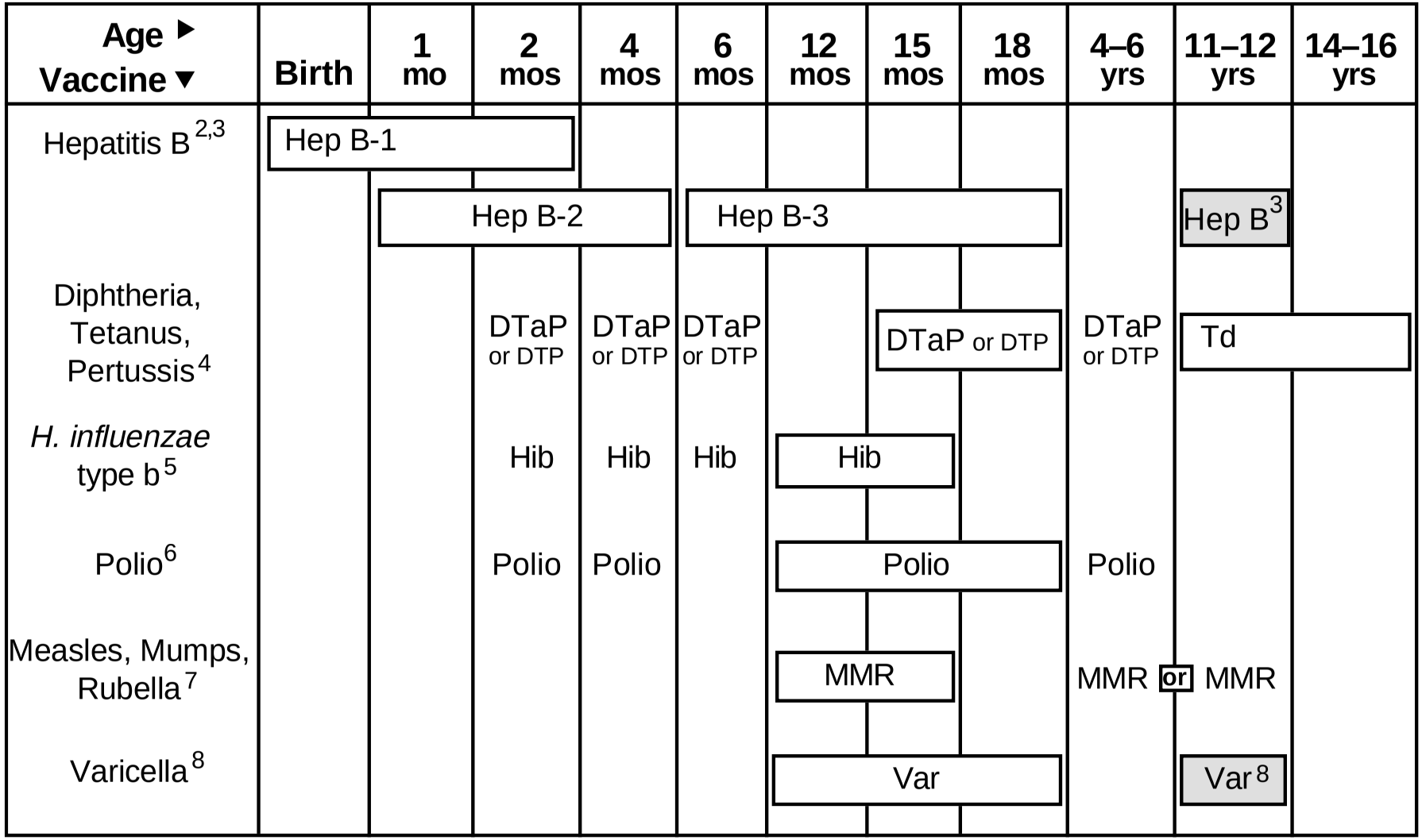
Recommended Childhood Immunization Schedule United States, January–December 1997

Vaccines[1] are listed under the routinely recommended ages. Bars indicate range of acceptable ages for vaccination. Shaded bars indicate catch-up vaccination: at 11–12 years of age, Hepatitis B vaccine should be administered to children not previously vaccinated, and Varicella Virus vaccine should be administered to unvaccinated children who lack a reliable history of chickenpox.



(see footnotes on back)

[1] This schedule indicates the recommended age for routine administration of currently licensed childhood vaccines. Some combination vaccines are available and may be used whenever administration of all components of the vaccine is indicated. Providers should consult the manufacturers' package inserts for detailed recommendations.

[2] **Infants born to HBsAg-negative mothers** should receive 2.5 µg of Merck vaccine (Recombivax HB®) or 10 µg of SmithKline Beecham (SB) vaccine (Engerix- B®). The second dose should be administered >1 month after the first dose.
Infants born to HBsAg-positive mothers should receive 0.5 mL hepatitis B immune globulin (HBIG) within 12 hours of birth and either 5 µg of Merck vaccine (Recombivax HB®) or 10 µg of SB vaccine (Engerix- B®) at a separate site. The second dose is recommended at 1–2 months of age and the third dose at 6 months of age.
Infants born to mothers whose HBsAg status is unknown should receive either 5 µg of Merck vaccine (Recombivax HB®) or 10 µg of SB vaccine (Engerix- B®) within 12 hours of birth. The second dose of vaccine is recommended at 1 month of age and the third dose at 6 months of age. Blood should be drawn at the time of delivery to determine the mother's HBsAg status; if it is positive, the infant should receive HBIG as soon as possible (no later than 1 week of age). The dosage and timing of subsequent vaccine doses should be based on the mother's HBsAg status.

[3] Children and adolescents who have not been vaccinated against hepatitis B in infancy may begin the series during any childhood visit. Those who have not previously received three doses of hepatitis B vaccine should initiate or complete during the 11–12 year-old visit. The second dose should be administered at least 1 month after the first dose, and the third dose should be administered at least 4 months after the first dose and at least 2 months after the second dose.

[4] DTaP (diphtheria and tetanus toxoids and acellular pertussis vaccine) is the preferred vaccine for all doses in the vaccination series, including completion of the series in children who have received one or more doses of whole-cell DTP vaccine. Whole-cell DTP is an acceptable alternative to DTaP. The fourth dose of DTaP may be administered as early as 12 months of age provided 6 months have elapsed since the third dose and if the child is considered unlikely to return at 15–18 months of age. Td (tetanus and diphtheria toxoids, absorbed, for adult use) is recommended at 11–12 years of age if at least 5 years have elapsed since the last dose of DTP, DTaP, or DT. Subsequent *routine* Td boosters are recommended every 10 years.

[5] Three *H. influenzae* type b (Hib) conjugate vaccines are licensed for infant use. If PRP- OMP (PedvaxHIB® [Merck]) is administered at 2 and 4 months of age, a dose at age 6 months is not required. After completing the primary series, any Hib conjugate vaccine may be used as a booster.

[6] Two poliovirus vaccines are currently licensed in the United States: inactivated poliovirus vaccine (IPV) and oral poliovirus vaccine (OPV). The following schedules are all acceptable by ACIP, AAP, and AAFP, and parents and providers may choose among them:

1. IPV at 2 and 4 months; OPV at 12–18 months and 4–6 years
2. IPV at 2, 4, 12–18 months, and 4–6 years
3. OPV at 2, 4, 6–18 months, and 4–6 years

The ACIP routinely recommends schedule 1. IPV is the only poliovirus vaccine recommended for immunocompromised persons and their household contacts.

[7] The second dose of MMR is routinely recommended at 4–6 years of age or at 11–12 years of age, but may be administered during any visit, provided at least 1 month has elapsed since receipt of the first dose, and that both doses are administered at or after 12 months of age.

[8] Susceptible children may receive Varicella vaccine (Var) during any visit after the first birthday, and unvaccinated persons who lack a reliable history of chickenpox should be vaccinated during the 11–12 year-old visit. Susceptible persons ≥13 years of age should receive two doses, at least 1 month apart.

Approved by the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP).

Immunization Schedule Updates for Polio and DTaP

Rhonda Kremer
Bureau of Immunization

IPV/OPV Sequential Schedule

Following a two-year review by the Advisory Committee on Immunization Practices (ACIP), the Centers for Disease Control and Prevention (CDC) has accepted their recommendation for polio immunization. The new recommendation calls for the introduction of a sequential schedule of inactivated poliovirus vaccine (IPV) followed by oral poliovirus vaccine (OPV) for routine childhood immunization. The goal of the sequential schedule is to reduce the eight to ten yearly cases of vaccine-associated paralytic polio (VAPP), a risk from OPV that has become more relevant in recent years with the eradication of wild polio from the Western Hemisphere. (Overall, about one case of VAPP occurs for every two and a half million doses of OPV distributed.) The initial dose of OPV in the sequential schedule is not administered until 12 months of age, which follows two doses of inactivated vaccine to build immunity; the risk of VAPP is greater after the first **live** dose. In addition, this schedule allows for a wider margin of safety for the diagnosis of unsuspected cases of immunodeficiency, thus protecting children from administration of live vaccine and increased risk of VAPP.

The recommended sequential series consists of two doses of IPV (at 2 and 4 months of age), and two doses of OPV (at 12–18 months and 4–6 years of age). This schedule is the preferred means to prevent paralytic poliomyelitis, either from wild poliovirus or associated with OPV use, by providing high levels of both individual and community protection. Schedules that include OPV alone or IPV alone meet current standards of care and remain acceptable options for childhood immunization.

While the American Academy of Pediatrics concurred with the new schedule, other groups, such as the American Academy of Family Physicians (AAFP), the National Black Nurses Association, the National Coalitions of Hispanic Health and Human Services and other organizations have voiced concerns regarding the new schedule.

Critics claim that inner-city and other disadvantaged children, who are already at risk for missed immunizations, might only receive the initial IPV doses and never receive the subsequent OPV doses, which confers intestinal immunity against the wild polio virus. They also state that the increased number of injections may lead to an overall reduction in immunization coverage.

Rather than favoring a sequential schedule, the AAFP supports giving equal weight to the three polio options (2 IPV/2 OPV, 4 OPV, or 4 IPV), thus allowing for maximal patient/provider choice.

Another concern is cost. At current federal contract prices, it will cost an additional $6.34 per child to implement the sequential schedule.

To address concerns about the new recommendations, the ACIP drew up a list of action steps to be taken in the following months which include monitoring the impact of the new regimen on overall immunization coverage and on the rates of other vaccine-preventable diseases, maximizing the use of vaccine registries, conducting surveillance for vaccine-associated paralytic poliomyelitis, and assessing patient and provider knowledge and attitudes about polio vaccination. CDC will be working with opposition groups to achieve a smooth implementation.

The revised ACIP recommendations were published in the Morbidity and Mortality Weekly Report Recommendations and Reports, January 24, 1997. The Bureau of Immunization implemented the new polio vaccine recommendations as of March 1, 1997.

DTaP Recommendations

After years of concern over the side effects of whole cell pertussis vaccines, the Food and Drug Administration (FDA) licensed DTaP (Diphtheria, Tetanus Toxoid, Acellular Pertussis) vaccine for use in infants at 2, 4, 6 and 15-20 months of age. The Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP) recommends the use of acellular pertussis containing vaccine for the first four doses of the diphtheria, tetanus toxoid and pertussis vaccination series, as preferred to whole cell vaccine for routine immunization, including infants who have already received one or more doses of the whole cell vaccine.

Currently there are three DTaP vaccines licensed for the first four doses: Tripedia (Connaught), ACEL-IMUNE (Wyeth-Lederle) and Infanrix (SmithKline Beecham). Tripedia and Infanrix have not yet been licensed for the fifth dose among children 4 to 6 years of age who received either vaccine for the prior four doses because data are insufficient to establish the frequency of adverse events following a fifth dose. ACEL-IMUNE, however, has been licensed for all five doses in the series. All available acellular vaccines may still be used for the fourth and fifth doses for children who received three prior doses of whole-cell DTP.

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IMMUNIZE: Five Visits by Two, It's Up To You!

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Efficacy of the DTaP vaccine has been demonstrated in several large clinical trials in Europe and the United States during the last ten years. It appears that the new vaccine may confer longer protection against disease. In addition, the acellular vaccines are undergoing safety and efficacy testing for use in adults, who represent an important reservoir for pertussis disease and a source of infection for children. The ability to administer booster doses of vaccine later in life may counteract the waning of both vaccine-induced and natural immunity, which leaves adults susceptible to infection and subsequent transmission. Whole cell pertussis vaccines are currently not recommended for anyone over 7 years of age, due to concern over the potential severity of reactions in older children and adults. Acellular vaccines contain only specific proteins and have been demonstrated to be less reactogenic in children, which may hold true for adults as well.

Acellular pertussis vaccines are associated with a large reduction in the most frequent side effects, such as localized tenderness and fever greater than 101˚F. More serious side effects, such as drowsiness and irritability, exhibited significant reductions as well. The frequency of the most severe reactions, such as anaphylaxis and encephalopathy, did not appear to be different than those for the whole cell vaccine. However, these reactions are extremely rare and therefore were hard to assess for statistical significance in the recent clinical trials.

One disadvantage to the DTaP vaccine is the fact that it is not combined with Hib (*Haemophilus influenza* type b) vaccine as is the whole cell DTP, requiring the two be given in separate injections. However, it is anticipated that a new DTaP/Hib combination vaccine may be available for the primary series in the near future. The other disadvantage is the cost of administering separate DTaP and Hib vaccines, which, at current federal contract prices, cost more per dose than the DTP/Hib combination vaccine. However, with three available DTaP vaccines on the market, competition should result in price reduction.

The Bureau of Immunization implemented the new DTaP recommendations in January 1997. During the transition from the routine use of whole-cell pertussis vaccine (DTP) to acellular pertussis vaccine (DTaP), whole cell vaccines and vaccine combinations are acceptable for all doses in the pertussis vaccination series.

The current childhood immunization schedule can be found on pages 9 and 10 of this issue. **If you have any questions regarding the new DTaP or polio vaccine recommendations, please feel free to call the Bureau of Immunization at (573) 751-6133.**

Upcoming Symposium

Immunizations Today and Tomorrow

Bee Wise.
Immunize.

Friday, June 6, 1997
Community Center for Health and Education
Saint Joseph Health Center
1000 Carondelet Drive
Kansas City, Missouri

Physicians, nurse practitioners, nurses and other health care professionals from Kansas and Missouri are invited to participate in this symposium. This one-day event will highlight new developments in immunizations.

Sponsored by:

Kansas Department of Health and Environment
Missouri Department of Health
Merck Vaccine Division
Pasteur Merieux Connaught

The symposium will feature presentations from Dr. Bill Atkinson from the Centers for Disease Control and Prevention's National Immunization Program; Katie Steele, Regional Director of Health and Human Services, Region VII; Dr. Sandor Feldman, Chief of Pediatric Infectious Disease at University of Mississippi Medical Center; and Dr. Jay Lieberman, a pediatric infectious disease expert from Los Angeles. Breakout sessions will focus on tracking and registry issues, standards of immunization practice and state immunization issues and programs.

Continuing education credit will be available for nurses and physicians for this program.

The symposium is open by reservation to any person interested in immunization issues. Brochures with registration forms will be mailed in March. For more information or to be placed on the mailing list, please call the offices of the Mid-American Immunization Coalition at (816) 235-5479.

Well-Child Outreach Project

Terry Weston, B.A.
Bureau of Family Health

The Missouri Department of Health recognizes that preventive health screening for a child is the best way to detect problems at an early stage when they can most easily be treated. While parents may take their children to the doctor or clinic frequently, the visits are often due to illness or injury, when it is a matter of necessity. It is more difficult for parents with many obligations and time constraints to find additional time to schedule a well-child checkup.

A well-child checkup can include a physical examination; immunizations; vision, dental, lead and hearing screening; and a developmental screening. It offers parents the opportunity to ask questions about what to feed their children, what to expect in terms of their growth and development, and how to handle various behavior problems. Health care providers can furnish guidance on these parenting issues, as well as information on child safety. If problems are detected, the provider can schedule further evaluation, or refer the child or the family to other services as needed.

An effort is being made by the Department of Health to heighten the awareness of parents about the importance of preventive health screening. The department is also collaborating with the Department of Social Services' Division of Medical Services to increase the participation rate in Healthy Children and Youth exams (formerly known as EPSDT exams) for Medicaid-eligible children.

Bureau of Family Health staff distribute health education materials relating to preventive health screenings to families at health fairs and expos, and also to professionals who have direct contact with families. The bureau works with community-level organizations such as Parents as Teachers, HeadStart, licensed child care facilities, Division of Family Services offices and county health departments, as well as with doctors and clinics, to get this information into the hands of Missouri families. Media outlets such as radio and television programs and newspaper articles are also being utilized to help "get the word out" about preventive health screenings for Missouri's children. In addition, the bureau is working with family and consumer science classes in middle schools and in junior and senior high schools. Teachers of these classes will develop a curriculum on child health, culminating in a poster contest with the posters depicting a well-child exam.

If you have questions or suggestions for this program, please call Terry Weston at (800) TEL-LINK (800-835-5465).

TEL-LINK

TEL-LINK is the Missouri Department of Health's toll-free telephone line for maternal, child and family health services. The purpose of TEL-LINK is to provide information and referrals to Missouri residents concerning a wide range of health services. Callers are given referrals and then are transferred immediately to the appropriate agency.

The directory for the toll-free number includes:

- local health departments
- social service agencies
- prenatal clinics
- crisis pregnancy centers
- family planning clinics
- child care resource and referral agencies
- obstetric and pediatric hospitals
- area offices for children with special health care needs
- community health centers
- domestic violence shelters
- alcohol and drug abuse treatment centers
- sexual assault centers
- mental health centers
- crisis intervention centers
- other health care centers

Missouri residents may call 1-800-TEL-LINK at (800) 835-5465, Monday through Friday, between 8 a.m. and 5 p.m. to find out where services are located in their area and to order brochures and posters. Recorded messages are taken 24 hours a day, seven days a week.

Mosquito-Borne Disease Surveillance Program – 1996

Michael Hastriter, B.S., M.S.
F. T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

The Department of Health conducted surveillance programs for St. Louis (SLE), Western Equine (WEE), Eastern Equine (EEE), California (CE) and LaCrosse (LAC) encephalitis during the 1996 mosquito season. Active surveillance systems were operational for human cases of disease, equine cases of disease, virus activity in mosquitoes and virus activity in wild birds.

Human, horse and wild bird sera were tested using an enzyme linked immunosorbent assay (ELISA) technique designed for detection of IgM antibodies specific for the viruses mentioned above. Suspect positives were submitted to the Centers for Disease Control and Prevention (CDC) for confirmation.

Active Surveillance for Human Cases of Disease

Human arboviral surveillance activities consisted of standard weekly reporting by physicians in addition to statewide telephone contact with pre-designated hospitals on a weekly basis through the sentinel active surveillance system. Seven human sera were analyzed. SLE, WEE and LAC were not detected, indicating that there were no human arboviral cases detected in Missouri. Illinois had one case of SLE.

Active Surveillance for Equine Cases of Disease

Thirteen veterinarians throughout the state were contacted by telephone on a weekly basis. Fourteen equine sera were analyzed and found negative for SLE, WEE and EEE. All reports indicated no arboviral activity in horses in Missouri during this period. Large numbers of horses are vaccinated against these diseases.

Active Surveillance for Arboviral Activity in Wild Birds

Trapping of wild birds began on May 1, 1996 via a contract with the Wild Animal Damage Control Unit of the United States Department of Agriculture. A total of 1,001 wild birds of five species were collected from eight counties (Boone, Buchanan, Cape Girardeau, Cass, Jackson, Marion and St. Louis) through October 1, 1996. The majority of birds were English Sparrows; other bird species included Common Grackles, Cardinals, Barn Swallows and European Starlings. Sera from all birds were negative.

Arboviral Surveillance in Vector Mosquito Population

The earliest adult mosquito collections began on May 16, 1996 and all areas were fully operational by the second week of June. Trapping was accomplished with CO_2 baited CDC and EVS Light Traps, Reiter Gravid Traps and hand collection at selected resting stations by aspirator. Collections were done in four areas: Cape Girardeau County, Clay County, St. Louis County and St. Louis City. Vector mosquito populations as evaluated from this limited sampling, plus general observations, were considered to be low. Although it is impossible to accurately gauge rainfall for the entire state, the National Weather Service considered rainfall for Missouri to be slightly above average in 1996.

The Virology Laboratory at Southeast Missouri State University provided analysis for EEE, WEE, SLE and LAC virus in vector mosquitoes. There were 1,945 pools of adult vector mosquitoes tested for WEE, SLE and LAC by antigen capture ELISA. Pools included 48,725 specimens of *Culex pipiens, Culex restuans, Culex salinarius, Culex tarsalis, Coquillettidia perturbans, Aedes triseriatus* and *Aedes albopictus.* All tests were negative, indicating that arboviral activity was not occurring or could not be detected in mosquitoes in these areas.

Nuisance adult mosquito populations were high during the early mosquito months. Once natural predators caught up and consumed the food supply, the number of nuisance mosquitoes did not appear to be a problem. The composition of the nuisance mosquitoes caught in the light traps were primarily *Aedes vexans, Culex erraticus, Psorophora sp.* and *Anopheles sp.*

Discussion

The floods of 1993 and 1995 have potentially increased the risk of mosquito-borne diseases for the next four to six years. With federal funding from the emergency flood grant, Missouri was able to implement three active prevention surveillance systems: wild bird surveillance, sentinel chicken flock surveillance and mosquito surveillance. These programs were conducted in addition to an expanded active human and equine surveillance system. From 1993 through 1995, a window of opportunity was presented to permit action to be taken to prevent outbreaks of disease in human populations. Grant funds were terminated on October 20, 1995, but other resources were utilized to operate active surveillance systems for human and equine cases of disease, wild bird surveillance and a limited mosquito surveillance system in 1996.

Mosquito-borne disease outbreaks normally occur three to four years after a major flood, after there is amplification of the virus in the environment. Based on the fact that Iowa found SLE in a

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Tuberculosis Diagnostic Services

Bureau of Tuberculosis Control

The Tuberculosis Diagnostic Services Program was started in July 1993 as part of the effort to control and eliminate tuberculosis. The program provides tuberculosis evaluation services for economically disadvantaged patients, particularly those in rural areas of the state, who are identified as infected with, or suspected of having, tuberculosis.

The eligibility of a client to participate in the Diagnostic Services Program is determined by the local health agency, based on the following criteria:

1. Skin test positive or having signs or symptoms of tuberculosis disease;
2. Not covered by health insurance; **and**
3. Without the financial capability of accessing proper health care services for tuberculosis.

Once eligibility is established, the patient is allowed to choose a physician from a list of Diagnostic Services Program providers. The local health agency assures that an appointment is made for the patient and that appropriate follow-up occurs. If the patient is placed on medications, the local health agency will see that the patient receives the proper regimen. The entire regimen of medications is sent to the local health agency by a participating pharmacy on contract with the Missouri Department of Health, Bureau of Tuberculosis Control. There is no cost to the patient for tuberculosis medications.

The local health agency monitors the patient's compliance, and checks the patient for any signs or symptoms of drug toxicity and for signs of an improving or worsening condition. Directly observed therapy (DOT) for tuberculosis disease patients is also provided by most county health departments. As the name implies, DOT involves an individual directly observing a tuberculosis patient as they take the tuberculosis medication to be sure they are ingesting the proper dose at the proper time for the proper number of months.

All clinical specimens for diagnostic testing are sent to the Missouri State Tuberculosis Laboratory at the Missouri Rehabilitation Center in Mount Vernon. As a consequence, there are no costs associated with testing incurred by either the participating physician or the patient.

The Diagnostic Services Program will pay for eight office visits, one chest x-ray and induced sputum collection for tuberculosis follow-up at specific, pre-set rates.

New doctors and clinics are added monthly to the growing list of providers. Currently there are 57 providers in 39 counties of the state. Since the inception of the program, 755 individuals have received diagnostic and treatment services.

Interested clinics or physicians may contact the Bureau of Tuberculosis Control at (573) 751-6122 or 1 (800) 611-2912 for information on how to enroll in this program.

Mosquito-Borne Disease Surveillance

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sentinel chicken flock and Illinois had two human cases of SLE in 1995, along with SLE activity in wild birds in Missouri, it was anticipated that 1996 had the potential for an abundance of SLE activity if climatic conditions produced an abundance of vector mosquitoes. The surveillance systems operated during 1996 did not produce evidence of viral activity or disease.

The goal of surveillance is to detect cases of disease and then take specific action to prevent additional cases of disease. In this instance, neither cases of disease nor viral activity were detected, thus action to prevent additional cases was not necessary. Presuming that the surveillance implemented was adequate, the surveillance program also met its objectives and was successful. The fact that health officials knew that secondary preventive measures did not need to be taken also constitutes success.

Without an adequate surveillance system, the human population could be affected before health officials know of the problem and before they could muster an assessment of the situation, develop policy and take preventive action.

Abortion Alternatives

(continued from page 3)
providers begin truly collaborating for the purpose of enhancing the lives of the women they serve, abortions will decrease and families will be strengthened.

Contracts were provided for all of the above programs in the middle of October. It was a Department of Health decision that understanding the problem better and spending the time necessary to develop what will hopefully be effective long-term interventions was well worth the effort. The department estimates that significant outcomes from these interventions will take several years. This program must be delivered in the context of fully accessible family planning services.

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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

This newsletter can be recycled.

LATE BREAKERS

Look for this new feature in future issues of the *Missouri Epidemiologist*. We will use this format to announce items of current interest in public health.

- ☞ According to the most recent National Immunization Survey (NIS), 76% of Missouri's two-year-olds are appropriately immunized. The NIS is an ongoing survey that provides estimates of vaccination coverage among children aged 19–35 months of age for each of the 50 states and 28 selected urban areas. Children born during February 1992 through May 1994 were included in this reporting period. The results reflect immunization levels for the four DTP, three polio and one MMR series. The national average for this series is also 76%. For more information, contact the Bureau of Immunization at (573) 751-6133.
- ☞ Since the resignation of Dr. Coleen Kivlahan effective November 30, 1996, Ronald W. Cates is serving as the Interim Director for the Department of Health and Bert Malone is serving as Interim Deputy Director. They can be reached by phone at (573) 751-6001, or you can reach Mr. Cates by e-mail at CatesR@mail.health.state.mo.us.
- ☞ Tuberculosis in Missouri continues to decline from 244 cases reported in 1995 to 224 cases reported in 1996. For more info, call TB Control at (573) 751-6122.
- ☞ Spring flooding is likely in Missouri. To date in 1997, three deaths in Missouri have been attributed to flash flooding/low water crossings. Do not attempt to cross flooded roadways and bridges. Two feet of water will carry away most vehicles. Driving through as little as eight inches of water can stall a small vehicle.

Hepatitis A

(continued from page 6)
infection or the adverse consequences of infection, as:

- Persons traveling to or working in countries with high or intermediate endemicity of infection.
- Children in communities with high rates of HAV infection and periodic HAV outbreaks.
- Men who have sex with men.
- Illegal drug users.
- Persons with occupational risk of infection (such as working with HAV-infected primates or with HAV in a research laboratory).
- Persons with chronic liver disease.
- Persons with clotting factor disorders.
- Other groups such as foodhandlers.

Missouri EPIDEMIOLOGIST

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Exposure Investigation in Cadet, Missouri

Alyce Turner, B.S., B.A.
Bureau of Cancer Control

Robert H. Johnson, M.D.
Agency for Toxic Substances and Disease Registry

Gale Carlson, M.P.A.
Bureau of Environmental Epidemiology

Summary

Environmental exposure investigations can be very time consuming and often cannot link reported health problems with suspected exposures. This is especially true with investigations involving air emissions. Many industrial emissions involve proprietary information or involve hazards that may not be *currently* regulated by state or federal authorities. The investigation in Cadet, Missouri, is a typical example.

For many years, residents in and around the town of Cadet, in Washington County, had complained to the Missouri Department of Health (DOH), the Missouri Department of Natural Resources (DNR) and the Environmental Protection Agency (EPA) about odors which they believed had adversely affected their health and the environment. Local residents specifically wanted to know if their concerns were related to environmental releases of contaminants from the Buckman Laboratories, Inc. chemical plant located in Cadet, Missouri.

After several meetings with concerned citizens, DOH's Bureau of Environmental Epidemiology (BEE) and the Cancer Inquiry (CI) Program of the Bureau of Cancer Control, with assistance from the Agency for Toxic Substances and Disease Registry (ATSDR) assessed the health of residents and calculated the cancer rates for the area. While the ATSDR found a plausible association between some of the symptoms reported by residents and chemicals used at the plant, there has been no environmental or biological sampling that could document exposure. And although the CI Program saw elevated mortality rates for some forms of cancer in the area, there was no clustering of cancer cases around the chemical plant, and a review of the medical literature identified no known association between the types of chemicals used in the plant and the types of cancers present in the residents.

Background

The Buckman Laboratories, Inc. chemical plant in Cadet produces approximately 20 different products: preservatives, swimming pool chemicals, water treatment products, and other chemicals for industry and commercial use. It has been in operation since the 1960s. Approximately 50 homes in Cadet are within a one mile radius of the plant; 20 of these are in a valley which is often downwind from the chemical facility. The Cadet community consists of approximately 200 people living in an unincorporated town. Presently, reliable air monitoring data, on- or off-site, for the specific chemicals being used or produced by the plant is not available.

In the spring of 1995, BEE began receiving telephone calls from residents who lived near the plant complaining about chemical releases into the air and water. The residents felt these releases were causing a wide variety of adverse health effects ranging from eye, nose, and throat irritation to cancer, and even premature deaths. The telephone complaints were sporadic and concentrated during times when the residents said they smelled noxious odors and felt respiratory discomfort. Complaints about releases into the water always recounted a single event that seems to have occurred approximately ten years ago involving the release of a green colored substance and subsequent fish kills.

Chronology of the Investigations

The First Public Availability Session and Its Aftermath

In May 1995, BEE and DNR jointly sponsored a public availability session in Cadet to collect information about

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these health concerns and to discuss what DNR was doing in regard to environmental monitoring around Buckman Laboratories. DNR inspects the plant on a regular basis, as well as in response to citizen complaints, for air and water permit requirements. There have been violations of water permit requirements at Buckman Laboratories in the past, and the plant has remediated those problems. DNR's air monitoring program has not found the plant in violation of any air permit regulations. The inspection system DNR uses, however, does not appear to be effective in documenting permit violations at this type of industry, where intermittent batch releases of chemicals may take place.

Staff from the CI Program also participated in the public availability session to collect information on concerns about excess levels of cancer. Representatives from both the local plant and the plant's corporate office in Memphis, TN were on hand to talk with residents.

Of the 30 persons attending the session at a local high school, a small number of residents volunteered to be interviewed by DOH. DOH committed to following up health complaints with:

1. Private drinking water well testing,
2. An investigation of self-reported health effects to look for possible relationships to exposure from chemical releases from the plant, and
3. A check of state cancer data to see if cancer incidence (i.e., number of new cancer cases) and cancer mortality (i.e., deaths caused by cancer) rates in the area were higher than average for the state and the nation.

The CI Investigation

In January 1996, the CI Program initiated an inquiry into possible cancer rate elevations in the Cadet zip code (63630) area, using data from DOH's State Center for Health Statistics to calculate cancer mortality rates, and data from the Missouri Cancer Registry (MCR) to calculate cancer incidence rates. These rates were then compared to the cancer mortality rates of the entire state of Missouri for the years 1984–94, and to the national cancer incidence rates from the Surveillance, Epidemiology, and End Results (SEER) data from the National Cancer Institute (NCI).

The Second Public Availability Session and Its Aftermath

A second availability session was held in March 1996, and was attended by 225 persons. DOH was represented by individuals from BEE, the CI Program and the Bureau of Cancer Control's Breast and Cervical Cancer Control Project (BCCCP). BEE presented a report which indicated that respiratory problems reported by residents may indeed be related to chemical releases from the plant. However, other life-threatening illnesses, such as cancer, were unlikely to be related to the chemical exposures. This report was based primarily on a self-reported exposure and health effects questionnaire that was administered by DOH to 14 individuals from five families. Additional information for the report came from an interview held with Dr. David Mullens, the family physician who cares for many of these family members. He expressed concern about the number of respiratory complaints that he had received. The report also included the results of the testing of residents' wells, which did not reveal any chemical contamination. However, a number of the wells had elevated bacteria levels and appropriate recommendations were made to those property owners to remediate those bacteria problems.

In addition to the information session, DNR held an evening public hearing on the request of Buckman Laboratories for an extension of a waste water treatment permit. An expressive group of residents dominated the meeting, directing a number of questions about the possible contaminants in the air and water to DNR water program personnel. Many residents described their families' health problems, particularly those among children. Residents alerted DNR staff to barrels of hazardous material buried on the Buckman property, which DNR was aware of but had not previously associated with this investigation.

As a result of this meeting, both DNR and Buckman Laboratories became more involved in community concerns. Also, the CI Program continued their preliminary investigation of cancer rates, having been provided a list of local cases by concerned citizens from the town of Cadet.

The ATSDR Investigation

Some residents did not feel the BEE report was comprehensive enough, and asked DOH to expand its investigation. Subsequently, DOH requested the Exposure Investigation Section of ATSDR to assist ATSDR Region VII staff and DOH personnel in assessing the health of the local community as part of an exposure investigation at the site of the Buckman Laboratories, Inc. chemical plant. The resulting investigation consisted of obtaining a basic medical history, and conducting a brief physical examination, on local residents who had completed a health questionnaire.

The health questionnaire was administered by ATSDR and DOH staff, with assistance from the Washington County Health Department, to all willing households within one mile of the Buckman Laboratories plant. An ATSDR physician and a Washington County Health Department nurse then offered participating individuals the opportunity to ask questions and to have a limited medical history and physical examination performed.

The medical history included a review of the person's past medical history, exposure history, and any current symptoms being experienced. The physical examination included vital signs (i.e., blood pressure, pulse, respirations); a brief examination of skin, eyes, ears, nose, throat, thyroid, heart, lungs, abdomen and extremities; and a neurological examination.

Sixty-three local residents who had completed the health questionnaire and signed a consent form underwent this limited medical history/physical examination. Additionally, 30 (47.6%) of the 63 residents who underwent the medical history/physical examination signed consent and medical release forms permitting review of their medical records by the ATSDR physician.

Results

The ATSDR Investigation

Community members discussed their symptomatology and shared a general feeling in the community that most of the respiratory illness, neurological disease, cancer, pregnancy terminations, and congenital birth defects experienced by community residents had been caused by the plant.

After reviewing information made available from Buckman Laboratories, ATSDR found that the possible chemical contaminants that may be associated with the symptoms expressed include:

Ammonia
Bromine
Butylene Oxide
Carbon Disulfide
Cyanamide 50
Dimethylamine
Epichlorohydrin
Ethylene Dichloride
Formaldehyde
Hydrogen Peroxide
Methylene Chloride
Monomethylamine
P-Mix
Phosphorous Trichloride
Potassium Hydroxide
PY-AP
RC-620
Sodium Hydroxide
Sulfuric Acid
Tall Oil Fatty Acid

Plausible associations between experienced symptoms and potential contaminants can be summarized as follows:

1. Individuals exposed to the fumes and odors from the plant describe an acute symptom complex. This complex consists of headache, nausea, nasal and pharyngeal burning and congestion, chest tightness, shortness of breath, fatigue, and aching joints.

   Several of the chemicals used or produced at the plant could be involved in producing these symptoms. Dimethylamine, sodium and potassium hydroxide, and sulfuric acid may produce irritation of the throat, nose and eyes. Carbon disulfide, bromine and methylene chloride may produce headache, fatigue and dizziness. Formaldehyde, ammonia, sulfuric acid, bromine, methylene chloride and epichlorohydrin may be associated with cough, bronchospasm, chest tightness and shortness of breath.

   Clearing of these symptoms is variable, ranging from two hours to 72 hours after the fumes are no longer noticeable. Individuals with underlying asthma, coronary heart disease and arthritic conditions occasionally complained of continued symptoms past this time.

2. Complaints of rashes and chronic otitis media were common but less consistent and not easily correlated with episodes of fumes. Dimethylamine, sodium and potassium hydroxide, ammonia, carbon disulfide, sulfuric acid, bromine, methylene chloride and epichlorohydrin are possible chemicals released from the plant that can potentially produce skin rashes and skin irritations. Chemicals associated with serous otitis/chronic otitis media include dimethylamine, sodium and potassium hydroxide, ammonia, formaldehyde and sulfuric acid.

3. Concerns about neonatal deaths, brain cancer, hydrocephalus and developmental problems were also expressed by a few of the local residents. The compounds carbon disulfide and epichlorohydrin have been associated with adverse reproductive outcome.

The investigations did not identify imminent, life-threatening health effects at this site. There is a syndrome of headache, respiratory distress/congestion, conjunctivitis, pharyngeal discomfort, nausea and fatigue which seem to be present when the odors from the plant are strong. Investigators were unable to go beyond this temporal association to demonstrate acute, subacute or chronic health problems which are related to airborne chemicals or fumes from the plant.

All health effects and risks are only *speculative* at this time. Some of the symptoms and medical problems described by community members have been associated in the medical literature with exposure to the types of chemicals found at the Buckman Laboratories plant. It is plausible that some of these health concerns may be associated with exposure to these chemicals. However, none of the environmental or biological sampling conducted in this investigation have documented such exposures.

The CI Investigation

Results of the investigation undertaken by the CI Program indicated that total cancer incidence rates in the Cadet zip code area do not appear to be elevated compared to cancer incidence rates for the rest of the nation. Mortality rates for brain, breast, liver, myeloma, oral, other and total cancers were found to be higher than expected for some age and sex groups when compared with state rates.

The CI Program investigators suspected that some of the types of cancer that had elevated incidence rates (i.e. cervical, lung and liver) were related to life-style risk factors such as smoking, diet and alcohol consumption. Furthermore, the fact that different types of cancer are elevated in the zip code indicates that these cancers are from different sources. In addition, the increased cancer death rates (mortality) for some types of cancer, such as breast cancer, may indicate lack of cancer screening and lack of access to health care. Although access can be cultural, it appears that in this particular case the problem may be logistical. Washington County is quite rural and

(continued on page 5)

Cadet Cancer Risk Factors

What are the risk factors for the elevated types of cancer in the Cadet zip code?

The many different kinds of cancer that can affect different parts of the human body are considered to be separate diseases. Each of these different types of cancer has its own set of risk factors—factors that are associated with the development of the disease and may be part of the cause of the development. The number of different types of cancer found in the Cadet zip code indicates that the cancers are not all from the same cause.

The risk factors for **brain cancer** are not well understood. Studies have linked brain cancer with occupational, environmental, viral and genetic factors. Workers in certain industrial settings such as oil refineries and chemical and pharmaceutical manufacturing facilities, may have increased risk of brain cancer. Farm workers and their families exposed to pesticides may also have increased risk.

The risk factors for **breast cancer** include age, family history, previous breast cancer, reproductive experience (i.e., late child-bearing or no children), menstrual history (i.e., early onset of menstruation and late menopause), benign breast disease, large doses of radiation, high economic status, and diets high in fat, particularly animal fat or fat associated with red meat. Also, recent studies have suggested that some common pesticides that mimic the effects of estrogen may be linked to breast cancer.

The risk factors for **cervical cancer** include early age at first intercourse, multiple sex partners, cigarette smoking and some sexually transmitted diseases.

Risk factors for **Hodgkin's lymphoma** are largely unknown, but in part involve reduced immune function and exposure to certain viral infections like Epstein-Barr virus. Genetic factors such as ataxia telangiectasia may also play a role.

Primary **liver cancer** is cancer that first develops in the liver and may then spread to other organs. The most important risk factors for liver cancer include preexisting liver disease due to hepatitis B or C, or alcohol consumption, or exposure to certain chemicals (such as vinyl chloride), or to aflatoxin (a food fungus).

Cigarette smoking, including exposure to second-hand smoke, is by far the most important risk factor in the development of **lung cancer**. Cigarette smoking accounts for over 85 percent of lung cancer deaths. Occupational or environmental exposures to asbestos, radon, polycyclic aromatic hydrocarbons and other substances increase the risk. Smoking combined with occupational exposure to toxic substances dramatically increases the risk of lung cancer. Also, diets low in the consumption of fruits and vegetables may contribute to increased risk.

Smoking and spit tobacco are major risk factors for **oral cancer**. Over 90 percent of cases are associated with tobacco use. Excessive alcohol use is also an important risk factor. Combined exposure to tobacco and alcohol results in particularly high risk. Workers in certain industrial settings, such as in textile and leather manufacturing, are at increased risk for oral cancer.

The risk factors for **multiple myeloma** are not well understood. Studies have linked myeloma with both genetic and environmental factors. Multiple myeloma primarily affects older individuals and occurs twice as frequently in African-Americans as in whites. Workers in certain occupational settings, such as agricultural work and nuclear power plants, may have increased risk of multiple myeloma. Other occupational exposures that have been associated with myeloma include metals, rubber, wood, leather, paint and petroleum. In addition, exposure to ionizing radiation and benzene at the worksite have been linked with myeloma.

(continued from page 3)
extremely "under-served" regarding availability of medical providers. According to Department of Health 1991 figures, the state ratio of "population to active doctor" in Missouri is 512 to 1, compared to a ratio in Washington County of 5,162 to 1.

Although the total number of new cases of cancer in the Cadet zip code is not higher than expected, the total number of cancer deaths that occurred in the years 1984–94 in Cadet was significantly more than expected or predicted. During this period, 52 cancer deaths were predicted, but 70 deaths occurred. There were 18 more deaths than expected during those years.

The CI Program produced a map showing the location of reported cancer cases in the Cadet zip code for the years 1985–92. This was done by first locating the geographic coordinates of the residence of each case with a global positioning device, and then plotting these locations using a computerized Geographic Information System (GIS).

The primary goal of the mapping was to see how many cancer cases, and what types of cancer, occurred in the area close to the chemical plant. In addition, the distribution of the other cancer cases throughout the zip code was of interest.

Results of the mapping project indicated that 14 (19.7%) of the 71 total cancer cases in the Cadet zip code fell within a three-mile radius around Buckman Laboratories. The remaining 57 cancer cases were distributed throughout more heavily populated areas of the zip code. The cases near the plant included:

- three cases that represented three different types of cancer (i.e., liver, lung and brain cancers) whose current location of residence fell within a one-mile radius of the chemical plant.
- three cases representing two additional types of cancer (i.e., myeloma and cervical cancers) whose current residence was located one to two miles from the plant.
- eight cases representing possibly four different kinds of cancer (i.e., breast, lung and cervical cancers, plus a person with an unknown primary) whose current residence was located two to three miles from the plant.

These 14 cancer cases identified in the residential areas within three miles of the plant represent six or seven different cancer types, each with its own set of possible risk factors (see sidebar on page 4 for a description of risk factors). Investigators cross-referenced information from this list to see if any of the neoplasms reported—brain, liver, cervix, breast, lung, and bone marrow (myeloma)—were associated with possible contaminants at the Buckman Laboratories site. They found no strong associations or suspected causalities.

The map of the cancer cases in the Cadet zip code allowed review of the distribution pattern of these cases. There does not appear to be a clustering of cancer cases around the chemical plant.

It is important to reemphasize that these conclusions are based on the *entire* zip code and not just the town of Cadet. The town of Cadet has approximately 200 residents and the zip code has 3,508 residents. The lack of specific census data for Cadet and the small number of cases limits statistical analysis.

Conclusion

There continues to be local concern about the smells and fumes emanating from the Buckman Laboratories. Completed exposure pathways have not been demonstrated because environmental data is not available to indicate which, if any, chemicals may be the contaminants of concern. A health outcome data review has not shown an increase in cancer incidence in this community. Results of the literature review show no strong correlations between the chemicals that are potentially present and neoplasms which have been identified in the local area. Air sampling needs to be performed during time periods when area residents experience symptoms, including on-site, residential and indoor sampling. If air sample results merit further investigation, the agencies involved could consider performing biological testing. In the meantime, community members with health concerns were encouraged by letter to work closely with their local health care providers, and local physicians were encouraged to refer area residents for specialty care or evaluation.

In summary, a number of health and environmental agencies spent significant time and resources studying the problems in Cadet, MO. However, without adequate air monitoring data collected during the time when area residents experienced symptoms, the investigations were unable to establish associations between these exposures and health complaints from the local community.

The Cancer Inquiry (CI) Program provides a systematic method for responding to citizen concerns about excess cancer or perceived cancer clusters. The CI Program is within the DOH Division of Chronic Disease Prevention and Health Promotion. A cancer inquiry protocol was developed in 1984 with a two-stage process that emphasizes data collection, analysis and risk factor education. A multi-disciplinary committee of health and environmental specialists meet periodically to review citizen concerns, develop preliminary reports, and determine future action.

The process is initiated when DOH receives a report regarding a concern of possible excess in cancer cases in a particular area from a citizen, a health professional, a legislator or other government official. The usual concern is that the rate of cancer in their community might be greater than would be expected. The initial response is to determine if indeed there is a higher than expected rate of cancer in the area of concern. State databases are used to calculate mortality and incidence rates for the area of concern compared with rates in the rest of the state or nation. Epidemiologic factors evaluated for an inquiry include the type of cancer, temporal and spatial relations, the population at risk, the community profile, and possible environmental and occupational factors. Additional measures are taken when community exposure to a potentially hazardous site is possible. The goal of the CI Program is to provide community education, technical assistance and referral to appropriate agencies where needed.

Heat Surveillance Summary - 1996

Diane C. Rackers
Office of Epidemiology

The Missouri Department of Health, in cooperation with local health departments, has conducted some form of heat surveillance since the great heat wave of 1980 when 295 Missourians died due to heat-related causes. Through public health education and news releases the department works to increase the public's awareness of the dangers that high temperatures and humidity can have on their health.

During the summer months, the department monitors on a daily basis the heat indexes in five areas of the state and issues appropriate heat advisories as needed. See sidebar on this page. Two advisories were issued in 1996, a heat warning on June 21 and a heat alert on July 18.

On June 12, when heat indexes first reached 90º or above in three of the five areas of the state monitored, the Department of Health issued its annual news release urging awareness of heat-related illness. The department issued the first statewide heat warning on June 21 after heat indexes sharply increased on June 20 with continued high temperatures predicted to continue through the weekend. Heat indexes on June 20 were 112º in Cape Girardeau, 111º in St. Louis and 110º in Columbia and Kansas City, and 106º in Springfield. Heat indexes dropped and remained around 100º for the next three days. These four days of high heat indexes accounted for 15 percent (30/198) of the reported heat-related illnesses and 14 percent (1/7) of the recorded heat-related deaths in 1996. See Figure 1.

Heat indexes again increased to 100º or above on July 17 with 107º in Kansas City and Columbia, 105º in St. Louis, 104º in Cape Girardeau and 100º in Springfield. Because heat indexes were predicted to continue to increase and remain high through the weekend, the Department of Health issued the first

Stages of Heat Advisories Used in Summer 1996*

A **Heat Warning** will be issued when a heat index of 105° is first reached (or predicted). The Department of Health urges personal caution as well as concern for others at high risk. In addition, monitoring of temperatures is intensified.

A **Heat Alert** will be issued when:

1. The afternoon heat index has been at least 105° for two days and
2. When weather forecasts call for continued high-stress conditions for at least 48 hours over a large proportion of the state.

During a **Heat Alert**, the Department of Health encourages local health departments to arrange for cooling shelters, and also encourages other community agencies to provide relief from the heat stress.

The Department of Health will recommend to the Governor that a statewide **Heat Emergency** be declared when:

1. Extensive areas of the state are experiencing high and sustained levels of heat stress (determined when the heat index reaches 105° for three days); and
2. Increased levels of heat-related illnesses or deaths are found in these areas; and
3. The National Weather Service predicts that hot and humid conditions are likely to continue for several days.

The **Heat Emergency** designation will be canceled when the heat index falls below 105° for 48 hours and the National Weather Service predicts a low probability that severe conditions will return within 48 to 72 hours.

*NOTE: Different terminology will be used for 1997. See article on page 8 of this issue.

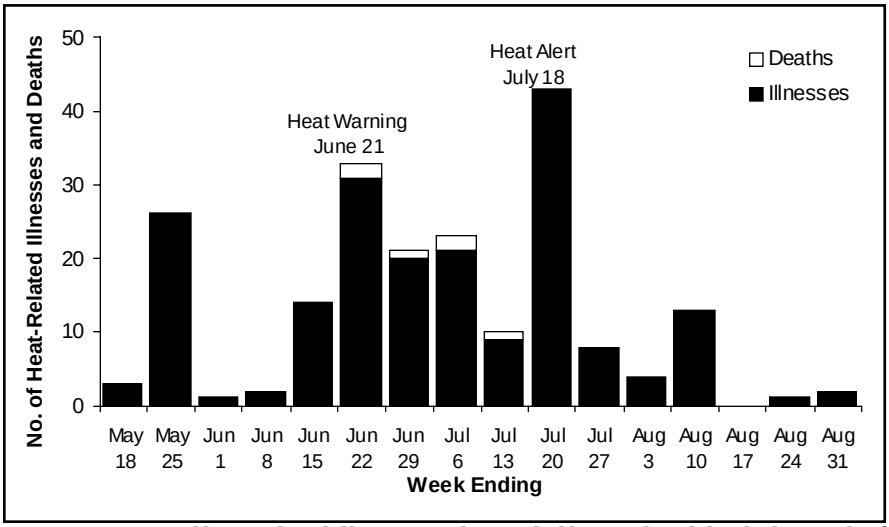


Figure 1. Reported heat-related illnesses and recorded heat-related deaths by week of occurrence, Missouri, Summer 1996.

statewide heat alert on July 18. Heat indexes across the state peaked on July 19 at 112º in Kansas City and Columbia, 110º in Cape Girardeau, 109º in St. Louis and 104º in Springfield. The statewide heat alert was lifted on July 22 after heat indexes dropped below 100º in three of the five monitored areas on July 21. This four-day heat wave accounted for 21 percent (42/198) of the reported heat-related illnesses. No heat-related deaths were recorded for this time period. See Figure 1.

It was noted that more heat-related illnesses were reported during the four-day heat wave of July 17-20 than the four-day heat wave of June 20-23. We usually see more illnesses during the first heat wave of the summer because Missourians have not yet acclimated to the heat. However, the first heat wave had only one day of high heat indexes compared to three days of continued high heat indexes during the second heat wave.

Heat indexes for the remainder of the summer were relatively low statewide and no further heat warnings or alerts were warranted.

Temperatures during the summer of 1996 were relatively mild with only four days having heat indexes of 105º or above in three out of the five areas of the state monitored. In 1995, there were 16 days when heat indexes were 105º or above in three of the five areas.

During the summer of 1996, one statewide heat warning and one statewide heat alert were issued, whereas three statewide heat alerts were issued in 1995. One statewide heat alert was issued in both 1994 and 1993; no statewide heat alerts were issued in 1992 or 1991.

In 1996, there were 198 heat-related illnesses reported. This is considerably lower than the 819 heat-related illnesses reported in 1995, which was the highest number reported since 1987 when the department started recording heat-related illnesses. See Figure 2.

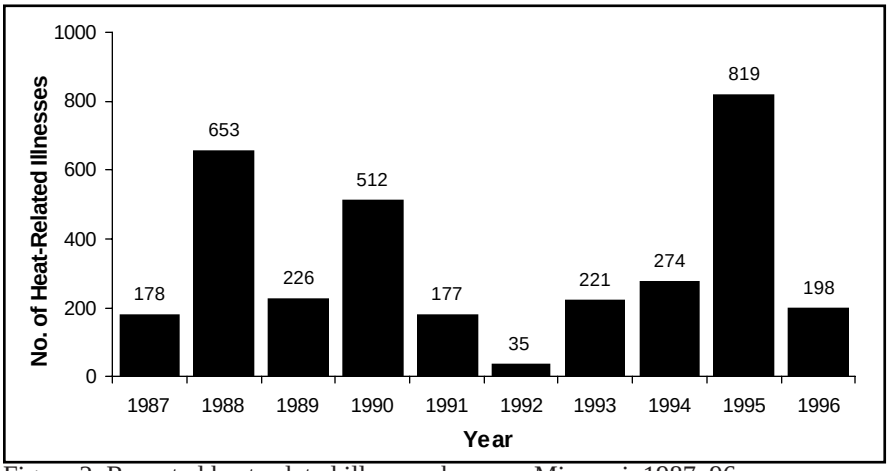


Figure 2. Reported heat-related illnesses by year, Missouri, 1987–96.

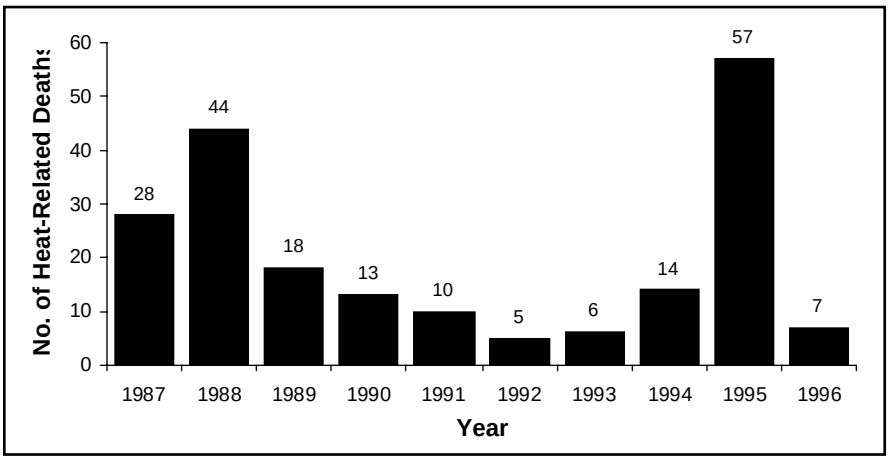


Figure 3. Recorded heat-related deaths by year, Missouri, 1987–96.

In 1996, there were seven heat-related deaths recorded. This is considerably lower than the 57 heat-related deaths recorded in 1995, which was the highest number recorded in the last ten years. See Figure 3. Four (57%) of the heat-related deaths were in individuals aged 49 or older. One death was a 3-month-old left in a parked car on a hot day. One death was a 4-year-old left in a hot room for an extended period of time. One death was a 15-year-old who died from disseminated intravascular coagulopathy, a suspected complication of heat stroke suffered while on a horseback riding trip.

As in past years, the St. Louis area accounted for a large proportion of the heat-related illnesses and deaths in 1996; 95 (48%) of the heat-related illnesses and 2 (29%) of the heat-related deaths. St. Louis public health authorities have implemented a comprehensive heat surveillance system that encourages the reporting of heat-related illnesses and deaths. St. Louis authorities declared one heat warning on June 21, and one heat alert, on July 18.

Physicians, physician assistants, nurses, hospitals, clinics or other private or public institutions providing care to any person diagnosed with or suspected of having or dying from a heat-related illness are encouraged to report them promptly to their local health authorities. Prompt notification of heat-related illnesses and deaths is essential for an effective heat surveillance system. For further information regarding reporting, call the Bureau of Communicable Disease Control at (800) 392-0272.

Changes in Heat Surveillance for 1997

Diane C. Rackers
Office of Epidemiology

The Department of Health has been encouraged by the National Weather Service to consider changing the terms used in heat advisory and surveillance activities. The media were confused when the Department of Health would issue a heat warning or heat **alert** while at the same time the National Weather Service was issuing a heat **advisory**. It was apparent that some consistency in terms was needed. Also, the department had noticed that they had received more media calls when they issued a statewide heat warning (the first phase of its heat advisories) on June 21 than when it issued a statewide heat alert (the second phase of its heat advisories) on July 18. This alerted the department to the need to consider reversing the terms used. (Definitions for heat advisories issued by the Department of Health in 1996 can be found in the sidebar on page 6.)

The terms **Heat Watch**, **Heat Advisory** and **Heat Warning** are usually thought of as weather terms associated with the National Weather Service. Their definitions for these terms are specific to weather conditions and do not take health factors into consideration. See sidebar above right. It seemed appropriate that the Department of Health should use terms that call attention to the health effects of heat. This would allow the media and the public to easily differentiate between heat advisories issued by the National Weather Service and those issued by the Department of Health.

After some discussion, the Department of Health has modified its policy for prevention of heat-related illness and death to use the following terms: **Hot Weather Health Advisory, Hot Weather Health Warning** and **Hot Weather Health Emergency**. See sidebar at right. We are encouraging other public health officials throughout the state to use these or similar terms in their heat-related illness prevention activities.

National Weather Service Stages of Heat Advisories

Heat Watch: Excessive heat expected to develop within the next 24-36 hour timeframe.

Heat Advisory: Daytime Heat Index (HI) reaches 105°F for a minimum of 3 hours, and the nighttime minimum HI does not go below 80°F.

Heat Warning: Daytime Heat Index (HI) reaches 115°F for a minimum of three hours, and the nighttime minimum does not go below 80°F.

Department of Health Stages of Hot Weather Health Advisories for 1997

A statewide **Hot Weather Health Advisory** will be issued when heat indexes of 105° in a large proportion of the state are first reached (or predicted). The Department of Health will inform the public about the risks of heat-related illness and urge concern for those at high risk. Monitoring of temperatures and heat indexes will be intensified. An **Advisory** will not be canceled.

A statewide **Hot Weather Health Warning** will be issued when:

1. Heat indexes, measured at peak afternoon temperatures, have remained at 105° or more for two days in a large proportion of the state **and**
2. When weather predictions are for continued high-stress conditions for at least 48 hours in a large proportion of the state.

During a **Warning**, the Department of Health will encourage local health departments to assure that cooling shelters are available and also encourage other community agencies to provide relief from the heat stress. A **Warning** will be downgraded or canceled when heat indexes in a large proportion of the state fall below 105° for 48 hours and the forecast is for 48–72 hours of continued relief from heat stress.

The Department of Health will recommend to the Governor that a statewide **Hot Weather Health Emergency** be declared when:

1. Extensive areas of the state are experiencing high and sustained levels of heat stress (determined when the heat index reaches 105° for three days); **and**
2. Surveillance data demonstrate increased levels of heat-related illness and death statewide; **and**
3. The National Weather Service predicts that hot and humid conditions are likely to continue for several days in a large proportion of the state.

An **Emergency** will be canceled when the heat indexes in a large proportion of the state fall below 105° for 48 hours and the National Weather Service predictions indicate a low probability for the return of severe conditions for the following 48 to 72 hours.

Prevention of Heat-Related Illness

Summer heat waves bring unusually high temperatures that may last for days or weeks. In the summer of 1980, a severe heat wave hit and 395 Missourians lost their lives from heat-related illness. Each year, high temperatures put people at risk.

People suffer heat-related illness when the body's temperature control system is overloaded. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body tempera–ture rises rapidly. Very high body temperatures may damage the brain or other vital organs.

Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions that can limit the ability to regulate body temperature include old age, obesity, infection or fever, diarrhea or dehydration, heart disease, poor circulation, diabetes, sunburn, and drug or alcohol use. Some medications impair your response to heat. For a listing of those medications, see page 10 of this issue.

Summertime activity, whether at the playing field, industry, home, office, farm or construction site, must be balanced with measures that aid the body's cooling mechanisms and prevent heat-related illness. To protect your health when temperatures are extremely high, remember to keep cool and use common sense. The following tips are important.

Increase Your Fluid Intake—During hot weather you need to drink more liquid than your thirst indicates. Ensure that infants and children drink adequate amounts of liquids. Avoid very cold beverages because they can cause stomach cramps. Avoid drinks that contain alcohol or caffeine because they will actually cause you to lose more fluid. If your doctor has prescribed a fluid-restricted diet or diuretics, ask your doctor how much you should drink.

Replace Salt and Minerals—Heavy sweating removes salt and minerals from the body. The easiest and safest way to replace salt and minerals is through your diet. Do not take salt tablets unless directed by your doctor. If you are on a low-salt diet, ask your doctor before changing what you eat or drink.

Wear Appropriate Clothing and Sunscreen—Choose lightweight, light-colored, loose-fitting clothing. In the hot sun, a wide-brimmed hat will provide shade and keep the head cool. Infants and young children should also be dressed in cool, loose clothing and their heads and faces shaded from the sun with hats or an umbrella. Sunburn affects your body's ability to cool itself and causes a loss of body fluids. Select a sunscreen with a sun protection factor (SPF) of 15 or higher to protect yourself adequately. Apply sunscreen 30 minutes before going outdoors and reapply according to package directions.

Pace Yourself—If you are unaccus–tomed to working or exercising in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity, get into a cool area, or at least in the shade, and rest, especially if you become light-headed, confused, weak or faint.

Stay Cool Indoors—The most efficient way to beat the heat is to stay in an air-conditioned area. If you do not have air conditioning, consider a visit to a shopping mall, public library or other air-conditioned location. Electric fans may be useful to increase comfort or to draw cool air into your home at night, but do not rely on a fan as your primary cooling device during a heat wave. A cool shower or bath is a more effective way to cool off. Limit use of your stove and oven to maintain a cooler tempera–ture in your home.

Schedule Outdoor Activities Care-fully—If you must be out in the heat, try to plan your activities so that you are outdoors either before noon or in the evening. While outdoors, rest frequently in a shady area. Avoid places of potential severe sun exposure such as beaches.

Use a Buddy System—When working in the heat, monitor the condition of your co-workers and have someone do the same for you. If you are 65 years of age or older, have a friend or relative call to check on you twice a day when heat or hot weather health advisories have been issued, and if you know anyone in this age group, check on them at least twice a day.

Monitor Those at High Risk—Those at greatest risk of heat-related illness include:

- infants and children up to 4 years of age
- people 65 years of age or older
- people who are overweight
- people who overexert during work or exercise
- people who are ill or on certain medications (See list of medications on page 10 of this issue.)

Adjust to the Environment—Be aware that any sudden change in temperature, such as an early summer heat wave, will be stressful to your body. You will have a greater tolerance for the heat if you limit your physical activity until you become accustomed to the heat. If traveling to a hotter climate, allow several days to become acclimated before attempting any vigorous exercise, and work up to it gradually.

Use Common Sense—Avoid hot foods and heavy meals—they add heat to your body. Do not leave infants, children or pets in a parked car.

Source: Extreme Heat/Extreme Cold–A Prevention Guide to Promote Your Personal Health and Safety, Centers for Disease Control and Prevention, 1996.

Medications Which Can Impair Your Response to Heat*

Generic Name (BRAND NAME)

Anticholinergics/Belladonna Alkaloids

Drugs containing Atropine (DONNATAL, LOMOTIL)
Drugs containing Clidinium (LIBRAX)
Dicyclomine (BENTYL)
Drugs containing Hyoscyamine (URISED)
Loperamide (IMODIUM)
Trimethobenzamide (TIGAN)

Antidepressant/Antipsychotics

Drugs containing Amitriptyline (ELAVIL, ENDEP, LIMBITROL, TRIAVIL)
Amoxapine (ASENDIN)
Bupropion (WELLBUTRIN)
Chlorpromazine (THORAZINE)
Desipramine (NORPRAMIN, PERTOFRANE)
Doxepin (ADAPIN, SINEQUAN)
Fluphenazine (PROLIXIN)
Haloperidol (HALDOL)
Imipramine (TORRANIL)
Lithium (ESKALITH, LITHOBID, LITHONATE)
Maprotiline (LUDIOMIL)
Nortriptyline (AVENTYL, PAMELOR)
Prochlorperazine (COMPAZINE)
Promethazine (PHENERGAN)
Thioridazine (MELLARIL)
Thiothixene (NAVANE)
Trazodone (DESYRLL)
Trifluoperazine (STELAZINE)

Antihistamines

Astemizole (HISMANAL)
Drugs containing Azatadine (TRINALIN)
Drugs containing Brompheniramine (DIMETAPP)
Drugs containing Chlorpheniramine (ALERMINE, CHLOR-TRIMETON, NALDECON, NOVAFED A, DECONAMINE, ORNADE)
Drugs containing Clemastine (TAVIST, TAVIST-1, TAVIST-D)
Cyproheptadine (PERIACTIN)
Diphenhydramine (BENADRYL, SOMINEX FORMULA)
Hydroxyzine (ATARAX, HY-PAM, VISTARIL)
Ipratropium (ATROVENT)
Meclizine (ANTIVERT)
Drugs containing Phenyltoloxamine (NALDECON, TUSSIONEX)
Drugs containing Terfenadine (SELDANE, SELDANE-D)
Drugs containing Triprolidine (ACTIFED)

Antiparkinsonians

Benztropine (COGENTIM)
Bromocriptine (PARLODEL)
Levadopa (DOPAR, LARODOPA)
Levodopa and Carbidopa (SINEMET)
Trihexyphenidyl (ARTANE, TRIHEXANE)

Heart Drugs

Acebutolol (SECTRAL)
Atenolol (TENORMIN)
Bumetanide (BUMEX)
Captopril (CAPOTEN)
Chlorothiazide (DIURIL)
Disopyramide (NORPACE)
Enalapril (VASOTEC)
Furosemide (LASIX)
Hydrochlorothiazide (ESIDRIX, HYDRODIURIL). Note that many heart drugs contain hydrochlorothiazide. Check with your doctor to see if yours does.
Indapamide (LOZOL)
Isosorbide Dinitrate (ISORDIL, SORBITRATE)
Labetalol (TRANDATE)
Lisinopril (PRINIVIL, ZESTRIL)
Methyclothiazide (ENDURON)
Metolazone (DIULO, ZAROXOLYN)
Metoprolol (LOPRESSOR)
Nadolol (CORGARD)
Nitroglycerin (DEPONIT, MINITRAN, NITRO-BID, NITRODISC, NITRO-DUR, NITROSTAT, TRANSDERM-NITRO)
Pindolol (VISKEN)
Prazosin (MINIPRESS)
Propranolol (INDERAL)
Spironolactone (ALDACTONE)
Terazosin (HYTRIN)
Timolol (BLOCADREN)
Trichlormethiazide (METAHYDRIN, NAQUA)

Oral Hypoglycemics

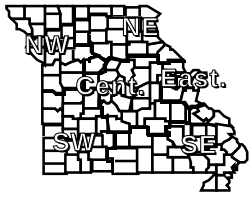
Acetohexamide (DYMELOR)
Chlorpropamide (DIABINESE)
Glipizide (GLUCOTROL)
Glyburide (DIABETA, MICRONASE)
Tolazamide (TOLINASE)
Tolbutmide (ORINASE)

Other Drugs

Orphenadrine (DISIPAL, NORFLEX, NORGESIC FORTE)
Oxybutynin (DITROPAN)
Tropicamide (MYDRIACYL)

Source: Public Citizen Health Letter, July 1994. Reprinted with permission of Philadelphia Association of Retail Druggists.

*Many of the drugs mentioned here are also in combination products or in other dosage forms not listed. Check with your doctor or pharmacist to ascertain if any of the medications you are taking contains any of these drugs.



Missouri Department of Health
Division of Environmental Health and Communicable Disease Prevention
QUARTERLY REPORT

Reporting Period *
October - December, 1996

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	3 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					FOR 1996	1995	FOR 1996	1995	5 YR MEDIAN
Vaccine Preventable Dis.																
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Hib Meningitis	0	0	0	0	0	0		0	0	0	0	0	3	0	10	12
Hib Other Invasive	0	1	0	0	0	0		0	0	0	0	1	6	8	18	44
Influenza	4	5	28	3	2	1		4	3	64	12	126	189	283	491	272
Measles	0	0	0	0	0	0		0	0	0	0	0	1	3	2	1
Mumps	0	0	0	1	2	0		0	0	1	0	4	3	10	25	40
Pertussis	5	0	4	2	4	5		2	6	1	0	29	21	74	63	83
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1
Tetanus	0	0	0	0	0	0		0	0	0	0	0	2	1	3	1
Viral Hepatitis																
A	30	14	12	30	200	26		17	19	67	97	512	265	1414	1338	1338
B	7	2	4	5	13	2		1	47	18	7	106	103	326	437	538
Non A - Non B	1	0	1	0	2	0		0	0	0	0	4	5	23	23	26
Unspecified	0	0	0	0	0	0		0	0	0	0	0	0	0	1	7
Meningitis																
Aseptic	8	1	2	6	0	4		2	2	2	0	27	49	120	269	269
Meningococcal	1	0	1	2	0	1		1	1	5	0	12	18	57	54	37
Enteric Infections																
Campylobacter	11	6	20	9	23	9		7	7	13	5	110	100	554	601	602
Salmonella	12	7	17	12	15	9		35	9	24	11	151	157	565	577	577
Shigella	31	0	11	14	4	3		0	4	6	2	75	341	387	1138	654
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	1	2	3	2
Parasitic Infections																
Amebiasis	0	0	1	0	0	1		1	7	0	0	10	6	31	18	25
Giardiasis	15	13	31	12	34	36		2	46	34	11	234	285	777	761	770
Sexually Transmitted Dis.																
AIDS	10	2	9	8	8	2	20	45	97	44	2	247	201	845	769	178
Gonorrhea	77	15	68	93	25	23		615	764	430		2110	2623	8415	11327	13147
Prim. & Sec. syphilis	0	0	0	4	0	0		2	23	9		38	86	221	584	987
Tuberculosis																
Extrapulmonary	1	1	0	1	1	2	0	2	3	3	1	15	7	41	43	10
Pulmonary	5	0	3	8	4	5	1	13	8	10	2	59	67	183	201	55
Zoonotic																
Psittacosis	0	0	0	0	0	0		0	0	0	0	0	0	1	0	0
Rabies (Animal)	0	0	0	2	1	0		0	0	0	0	3	5	26	30	28
Rocky Mtn. Sp. Fever	3	0	0	1	1	0		0	0	0	1	6	6	19	30	22
Tularemia	0	0	0	0	0	0		0	0	0	0	0	3	9	25	25

TEAR OUT FOR FUTURE REFERENCE

Low Frequency Diseases

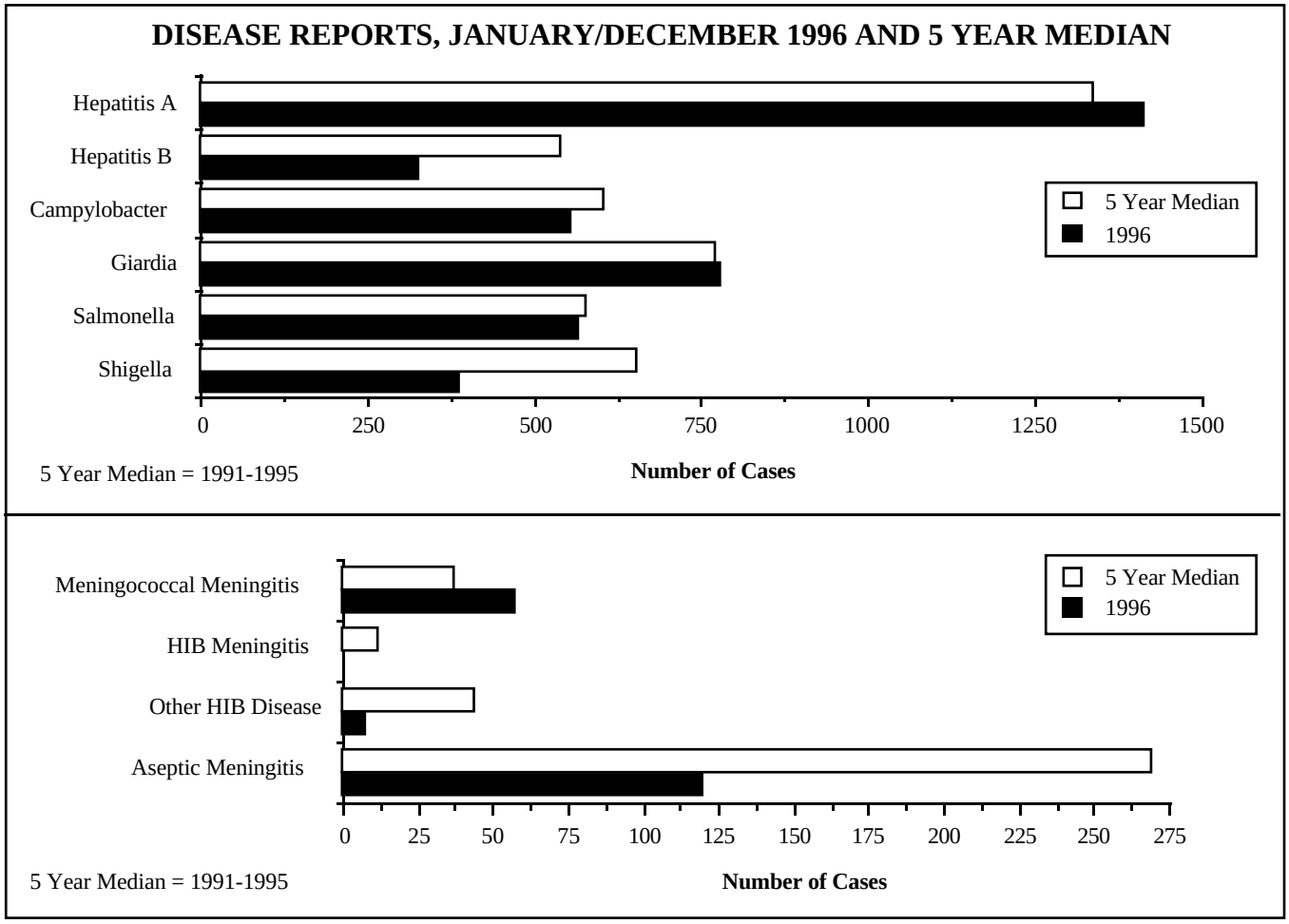
Anthrax
Botulism
Brucellosis - 1
Chancroid
Cholera
Cryptosporidiosis - 13
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 5
Legionellosis - 7
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 2
Trichinosis

Outbreaks

Foodborne - 5
Nosocomial - 1
Scabies - 7
Other
- Acute Respiratory - 5
- Campylobacter - 1
- Chickenpox - 1
- Fifth Disease - 1
- Hepatitis A - 2
- Influenza - 3
- Meningococcal Disease - 1
- Salmonella - 1
- Shigella - 1

*Reporting Period Beginning September 29, Ending December 28, 1996.
**Totals do not include KC, SLC, SLCo, or Springfield
***State and Federal Institutions

Due to data editing, totals may change.



Viral Hepatitis

Hepatitis A increased during the January/December 1996 time period by 5.7% from the 1338 cases reported in 1995. In 1995 the largest number of cases were in the Kansas City metro area, unlike 1996 where cases were associated with counties in the Southwestern Health District. A trend of increasing numbers of hepatitis A cases has pushed the five year median for the disease to 1338 cases. Hepatitis B cases fell by 25.4% from 437 cases in 1995 to 326 in 1996. This trend continues from 1994-1995 and may be associated with changes in the utilization of sexually transmitted disease clinics in large metro areas. Hepatitis B is 39.4% below the five year median for January/December of 538 cases.

Enterics

Campylobacter fell by 7.8% during 1996, from 601 cases in 1995 to 554 cases in 1996. It fell 7.9% from the five year median of 602 cases. Salmonella decreased slightly 2.07%, from 577 cases in 1995 to 565 cases in 1996. The five year median is 577 cases. Shigellosis declined by 65.9% from 1138 cases in 1995 to 387 cases in 1996. It fell 40.8% below the five year median of 654 cases. Shigellosis is at the lowest it has been since 1991 when there were 259 cases. Since that time the lowest number of cases has been 654.

Parasites

Giardiasis increased by 2.1% from 761 cases during 1995 to 777 in 1996. It increased by 0.9% from the five year median of 770 cases.

Meningitis

Aseptic meningitis fell by 55.4% from 269 cases in 1995 to 120 cases in 1996. This may be due in part to a decreased emphasis during 1996 on investigating and reporting single cases. The five year median is 269 cases. Meningococcal meningitis rose by 5.5% from 54 cases in 1995 to 57 cases in 1996. It increased 54.1% from the five year median of 37 cases.

HIB Disease

No cases of Hib meningitis were reported for 1996 and 10 cases were reported in 1995. This represents a decrease of 100.0% for the year and the five year median of 12 cases. The vaccine seems to have been very effective in reducing cases of meningitis in children. Other invasive cases (non-meningitis) of Haemophilus influenzae were in age groups unaffected by the vaccine. Other invasive Hib disease fell by 81.8% from the five year median of 44 cases and from 18 cases in 1995 to 8 cases in 1996, a drop of 55.5%. Other invasive Hib disease was made reportable in 1990 and there is now a five year median for this category. Hib disease was part of a special project of active surveillance for four invasive bacterial diseases in 1992 and 1993 and the decrease in the number of cases since that time probably reflects a return to passive surveillance for the disease.

Yellow Fever Vaccination Centers - 1997

The listing of yellow fever vaccination centers published in the November-December 1996 issue of the *Missouri Epidemiologist* contained some errors, so we are reprinting the entire list with corrections.

Joplin City Health Department
513 Kentucky Avenue
Joplin, MO 64801
Ph: (417) 623-6122
Thurs. 10 a.m., by appointment

Don S. Overend, M.D.
Smith-Glynn-Callaway Clinic
3231 South National Street
Springfield, MO 65807-7396
Ph: (417) 883-7422
Mon.–Fri., 8 a.m. to 5 p.m.
Sat., 8 a.m. to noon

Stephen D. Christiansen, M.D.
Ozark Medical-Surgical Associates, Ltd.
1900 South National, Suite 2800
Springfield, MO 65804
Ph: (417) 881-8819

Springfield-Greene County Health Center
227 East Chestnut
Springfield, MO 65802
Ph: (417) 864-1686
By appointment only

Clay County Health Department
1940 - 152 Highway
Liberty, MO 64068
Ph: (816) 781-1601
Wednesday, by appointment

Allen J. Parmet, M.D., M.P.H.
Midwest Occupational Medicine
Union Hill Commons
3037 Main, Suite 201
Kansas City, MO 64108
Ph: (816) 561-3480

Hansa N. Patel, M.D.
Natu B. Patel, M.D.
Bethany Medical Clinic
Box 506, South 69 Hwy.
Bethany, MO 64424
Ph: (816) 425-3154

Kevin Suttmoeller, D.O.
Academic Medicine, Inc.
800 West Jefferson
P.O. Box 1029
Kirksville, MO 63501
Ph: (816) 626-2235

University of Missouri
Student Health Center
University of Missouri Campus
South 6th Street
Columbia, MO 65201
Ph: (573) 882-7481
By appointment only

Stephen Dolan, M.D.
International Travel Clinic
Medicine Speciality Clinic
University Hospital
Hospital Drive
Columbia, MO 65212
Ph: (573) 882-3107
Thurs. morning, by appointment

Donald P. Miller, M.D.
Mark Winton, M.D.
Internal Medicine, Inc.
200 St. Mary's Medical Plaza
Suite 302
Jefferson City, Mo 65101
Ph: (573) 636-7183

Dr. Vladimir Gelfand
Deaconess Medical Center
Clarkston Square Shopping Center
1751 Clarkson Road
Chesterfield, MO 63017
Ph: (314) 537-0377

Edward F. Hendershot, M.D.
James H. Hinricks, M.D.
Northwest Infectious Disease Services, LLC
DePaul Professional Office Building
12255 DePaul Drive
Suite 250
Bridgeton, MO 63044-2585
Ph: (314) 344-7070

Barnes Care
5000 Manchester
St. Louis, MO 63110
Ph: (314) 531-5078

Barnes Care (Downtown)
401 Pine St.
St. Louis, MO 63102
Ph: (314) 621-4300

Barnes Care West
11501 Page Service Road
St. Louis, MO 63146
Ph: (314) 993-3014
Mon.–Fri., 8 a.m. to 4 p.m.

St. Louis County Department of Community Health and Medical Practice
John C. Murphy Health Center
6065 Helen Avenue
Berkeley, MO 63134
Ph: (314) 522-6410 Ext. 6322
Mon.–Wed., 8 a.m. to 4 p.m.
Thurs., 8 a.m. to 7 p.m.
St. Louis County residents only

Trav-L-Med, Inc.
12818 Tesson Ferry Road
Suite 101
St. Louis, MO 63128
Ph. (314) 849-6611

David C. Campbell, M.D., M.Ed.
Family Medicine Program
Deaconess Hospital
6125 Clayton Avenue, Suite 222
St. Louis, MO 63139
Ph: (314) 768-3685

Farrin A. Manian, M.D., M.P.H.
David A. Janssen, M.D.
Adult Infectious Diseases
621 S. New Ballas Rd., Suite 3002
St. Louis, Mo 63141
Ph: (314) 569-6171

Victoria Fraser, M.D.
Infectious Disease
Washington University
School of Medicine
Box 8051, 660 S. Euclid
St. Louis, MO 63110
Ph: (314) 362-4412

Ann Nicolazzi, M.D.
Health Line Corporate Health Services
1212 S. Grand
St. Louis, MO 63104
Ph: (314) 577-8060

Kirby Turner, M.D.
Kneibert Clinic
686 Lester, P.O. Box 220
Poplar Bluff, MO 63902-0220
Ph: (573) 686-2411

William C. Shell, M.D.
Ferguson Medical Group
1012 N. Main Street
P.O. Box 1068
Sikeston, MO 63801-5097
Ph: (573) 471-0330

Travelers' health information is available via Internet on the Centers for Disease Control and Prevention homepage at http://www.cdc.gov/ Choose the Travelers' Health menu to access guidelines for international travel. All material in the Travelers' Health menu is in the public domain, and may be used and reprinted without special permission. However, citation as to source is appreciated.

St. Louis STD/HIV Prevention Training Center

The St. Louis STD/HIV Prevention Training Center is one of ten regional centers funded by the Centers for Disease Control and Prevention (CDC) offering training for health care providers in the diagnosis, treatment and management of sexually transmitted diseases. The training center offers continuing education courses throughout Region VII of the U.S. Public Health Service (Iowa, Kansas, Missouri and Nebraska). The center is funded by a grant to the St. Louis County Health Department from CDC.

The target audience is health care professionals in public or private settings who provide clinical services to persons with, or at risk for, sexually transmitted diseases (STDs). Physicians, nurse practitioners and physician assistants will find courses tailored to their level of expertise.

The training center is accredited by the Missouri State Medical Association to sponsor continuing medical education credits (CME) for physicians. All courses have been approved for contact hours by the Missouri Nurses Association, which is accredited to approve continuing education units (CEU) in nursing by the American Nurses' Credentialing Center's Commission on Accreditation.

In conjunction with the Instructional Technology Center at the University of Missouri–St. Louis, the training center provides the didactic portion of courses using fiber-optic teleconferencing technology. Lectures are two-way audio and visual, allowing for interaction between faculty and students. Instruction is provided at various sites across Missouri and Iowa. In the fall, the center will be offering courses in Nebraska, and will offer classes in Kansas in the fall of 1998. Missouri sites include Columbia, Kansas City, Poplar Bluff and St. Louis. Course participants can attend the site of instruction closest to them, thereby reducing time away from their offices or clinics. After completing the didactic portion, participants are scheduled for hands-on training in St. Louis at a convenient time.

Courses are presented by faculty from Washington University, St. Louis University and community experts. Course instruction is coordinated by Bradley P. Stoner, M.D., Ph.D., Medical Director of the STD/HIV Prevention Training Center. Partners in training include the St. Louis County Department of Health, Washington University School of Medicine, St. Louis University School of Medicine, the University of Missouri–St. Louis and the St. Louis City Department of Health and Hospitals.

Laboratory Methods

Designed for personnel who perform basic laboratory procedures in support of STD clinical services, this course includes 12 hours of lecture and 12 hours of supervised clinical practicum.

Course Objectives: At the end of this course, participants will be able to:

- Demonstrate improved skills in performing stat laboratory tests including microscopy, serologic tests and culture
- Interpret STD laboratory test results
- Demonstrate universal precautions during specimen collection
- Describe safety, quality assurance and medical-legal aspects of laboratory management

Course Dates: Oct. 2, 9, 16 & 23, 1997
Course Fee: $50
Time: 9:00 a.m. to noon.
24 hours category 1 CME, 28.8 CEU

STD Clinician

This course, an intensive overview of STDs, includes 18 hours of lecture, 2 hours of case discussion and 24 hours of supervised clinical practicum.

Course Objectives: At the end of this course, participants will be able to:

- Demonstrate improved skills in completing a STD history and physical exam
- Integrate HIV risk assessment into patient care
- Describe clinical features of common STDs
- Demonstrate universal precautions during specimen collection
- Describe the process of partner notification and contact tracing

Course Dates: Oct. 30, Nov. 6, 13, & 20
Dec. 4 & 11, 1997
Course Fee: $75
Time: 9:00 a.m. to 12:30 p.m.
44 hours category 1 CME, 58.8 CEU

Syphilis Update

This course, a comprehensive study of the diagnosis, management and treatment of syphilis, includes 6 hours of didactic sessions and 16 hours of supervised clinical practicum.

Course Objectives: At the end of this course, participants will be able to:

- Discuss current trends of syphilis infection, including demographic and behavioral correlates
- Describe the current diagnosis and treatment recommendations for all stages of syphilis
- Recognize, differentiate and evaluate genital ulcers
- Describe the manifestations of primary and secondary syphilis
- Interpret the basic laboratory tests used to diagnose syphilis, including microscopy and serology
- Discuss methods to provide patient education regarding syphilis
- Describe the process of partner notification and contact tracing

Course Dates: Sept. 18 & 25, 1997
Course Fee: $40
Time: 9:00 a.m. to noon.
22 hours category 1 CME, 26.4 CEU

For futher information or to register for courses, contact the St. Louis STD/HIV Prevention Training Center at (314) 747-0294 or 747-1522. Further information is also available via internet at http://www.umsl.edu/services/itc/std_ptc.html.

Innovative Partnerships: A Community's Action to Improve Childhood Immunization Rates

William C. Goddard
Kevin S. Gipson
Carla Collette
Springfield/Greene County Health Department

In the late summer of 1995, results of the National Immunization Survey were released by the Centers for Disease Control and Prevention (CDC). For those children 2 years old and younger, Missouri was tied for 49th out of the 50 states surveyed. Missouri's compliance with recommended immunizations for the age group surveyed was 62 percent compared with the national average of 76 percent.

This information came as no surprise to the Springfield/Greene County Health Department. In 1993, the compliance rate for 2-year-olds in Greene County was only 46.8 percent. As a result, the health department made a strong commitment to improving that rate through a variety of efforts including special clinics, experimentation with clinics at local schools and focusing on outreach activity.

The result of these changes saw the immunization rate rise by over 11 percentage points to 57.5 percent for 1994. This rate was higher than the 25.6 percent for St. Louis City, 33 percent for St. Louis County, 51.6 percent for Kansas City and 53.1 percent for Joplin. While the improvement in the immunization rate was encouraging, the resources required to bring about these improvements were beginning to overtax the department's service capacity. Resources such as immunization space, parking and staff were being stretched to the breaking point.

A task force was formed in the spring of 1995 to address the immunization issue. The goal of the task force was to develop a strategy that would result in a more effective immunization program. While the goal of the task force was well defined, the means to achieve this outcome were tenuous at best. The task force still had to operate within the confines of the department's budgetary and staffing limitations. This case study will focus on the strategies employed by the Springfield/Greene County Health Department in addressing the immunization issue.

Barrier Identification

The task force was composed of employees from all levels of the health department, from the department director to clerical support workers. The first challenge that faced the task force was to identify the barriers that were responsible for low immunization rates. There are three barriers that are commonly identified in the delivery of public health programs to target populations: cost, access and information.

Cost Barriers

Cost barriers in the immunization program do not exist for the clientele that use the program. Because of federal, state and local government funding, immunizations are offered free of charge to all Greene County residents regardless of income level. Cost barriers in this case were actually a function of departmental budgetary limitations. Strategies to solve low immunization rates would necessitate no dramatic increase in budget outlays for the program.

Access Barriers

Access barriers are those barriers which deter an individual from utilizing service opportunities. In the case of the immunization program, there were a number of access barriers that were identified by the task force. The first access problem was directly related to the facilities used to house the program. The immunization clinic was held in the lobby of the health department building. While this lobby is quite large, it was not suited for the delivery of immunization services.

A second access barrier was directly related to the clinic's hours of operation. The clinic was open Tuesdays and Thursdays, 7:30–10:00 a.m., and the first Wednesday of every month, 12:30–3:00 p.m. These hours represented another access barrier since the clinic was not open at a time when the majority of parents were not working. Caretakers such as grandparents or baby sitters could not bring the child to the clinic for immunizations because the parent's presence was required for the immunizations to be given.

The final access problem was related to the location of the clinic itself. The health department building is located at the center of the city government complex. Parking space is limited at this complex, a fact that was exacerbated during clinic hours. Parking problems were amplified during high demand periods such as the back to school rush.

Information Barriers

Disseminating information in an effective manner is a crucial factor in the success of a public health program. In the case of the immunization program, there were several barriers that needed to be overcome. There was a great deal of confusion among the general public over hours of operation and the location of special clinics.

A second information barrier was related to the program's cost to the public. The task force was concerned that many families that fall just above the poverty line were not using the clinic because they mistakenly believed that vaccination services were means tested. This type of information barrier can have a

negative effect on the working poor who might not take advantage of a program if they believe there is a cost involved.

A final information barrier involved community education. Many serious childhood diseases have reemerged recently and at times have reached epidemic proportions in inner-city youth populations.[1,2] These facts underscore the importance of effective education programs aimed at parents of young children, an area that the task force felt could be improved upon.

Innovative Solutions

After all of the barriers were identified the task force began formulating a strategy to address the immunization issue. The most important component of this strategy involved the opening of a new immunization facility. The Center for Immunization Services is a separate facility and specializes only in immunizations, a fact that has resulted in major improvements in customer flow. This facility was opened on June 27, 1995 and was funded through reallocation of existing health department funds. The task force realized that a stand alone facility was only one piece of the puzzle. The development of alternative programs as well as the promotion of such services had to be accomplished if the program was to be successful.

Special off-site immunization clinics were developed to provide alternative locations for people within the service area who had problems with transportation services and provide a more convenient location that would eliminate barriers for people to get their children immunized. Clinic hours were expanded to include two evening sessions designed for working parents. Both of these needs were identified through survey research.

Partnerships with Public and Private Entities

The task force also formed a partnership with the Greene County Medical Society to streamline immunization protocols. This reduced the paperwork required in the immunization process by combining consent forms for different types of vaccine and limiting the language to make it more understandable. Handouts were developed that had more detailed information that could be read at the leisure of the client. This has resulted in faster clinic times and a reduction in administrative workload.

Because our local WIC clinic received office visits from over 67,000 women in 1995 to receive food vouchers, a system to provide immunizations for their children at the WIC clinic was established. This system provides a "one-stop shopping concept" for individuals receiving multiple services from the Springfield/Greene County Health Department.

A partnership was forged with the local Rotary Club to work together to improve the immunization rate for the county. The Rotary Club provided funding for a part-time nursing position, provided funding for promotional items, and donated creative development time through its membership for a public information campaign. This campaign included advertisements and public service announcements.

A partnership was also developed with the McDonald's Corporation. Local McDonald's restaurants provided giveaways at the clinics, donated appearance times for their Ronald McDonald and Hamburglar mascots at the clinic, and promoted the clinic by placing posters in their restaurants.

Local Wal-Mart stores also partnered with the health department. They provided space in their stores for booths which were used for awareness and scheduling. Wal-Mart also donated items for a giveaway promotion, allowed the distribution of brochures at their stores and provided pencils to be given away at a special kindergarten clinic.

The local chapter of the American Nurses Association also played a role in the development of services. They funded an immunization clinic on Saturdays; provided funding for a part-time nurse for the clinic; purchased promotional bumper stickers, bibs and activity books; paid for postage and purchased time for public service announcements.

A partnership was also developed with the Children's Miracle Network and Cox Health Systems who purchased a mobile immunization van. The Children's Miracle Network purchased the van, Cox Health Systems provides the driver and nurse and the health department provides vaccines, additional nursing support and record keeping. This van service is designed to provide immunization services to those who have trouble accessing the clinic.

The Springfield Public School System was also utilized for promotion of new services. The school system sent mailings to the parents of all children in the system, notifying them of the need to immunize their children. At kindergarten registration, a flyer was given to each parent to promote awareness of the clinic.

Caring Communities, a special partnership between five state agencies and seven schools/neighborhoods, provided immunization education at the seven area schools which it represents. The sessions were designed to promote awareness about the importance of childhood immunization as well as the expanded services provided by the Center for Immunization Services.

The Dickerson Park Zoo also participated in the promotion of the clinic by providing giveaways such as free tickets and a one-year membership to the Friends of the Zoo organization. Additional strategies that have since been identified and implemented include inserting informational flyers in local major employers (i.e., General Electric, Bass Pro, Aaron's Automotive, Paul Mueller, etc.) payroll envelopes and an aggressive callback program utilizing mail reminders and phone calls to parents whose children are in need of immunizations.

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Fatal Air Bag Injuries to Children and Small Adults

Kevin Miller
Office of Injury Control

In the past year, air bags have received unfavorable publicity because of dramatic instances in which children were killed by air bags. Media attention reached a peak in November 1996 when an infant girl in Idaho was decapitated by an air bag during a low-speed crash. Air bag technology, crash dynamics and the quantification of air bag efficacy are complex topics incapable of tidy summary. However, children riding in the front seat appear to be at greater risk of death in vehicles with passenger air bags than in vehicles without. Of course, the back seat has always been and still is safer than the front. Crash data also show that small and elderly adults are at some risk from air bags. It should be noted that the overall success of driver air bags in reducing morbidity and mortality is beyond question.

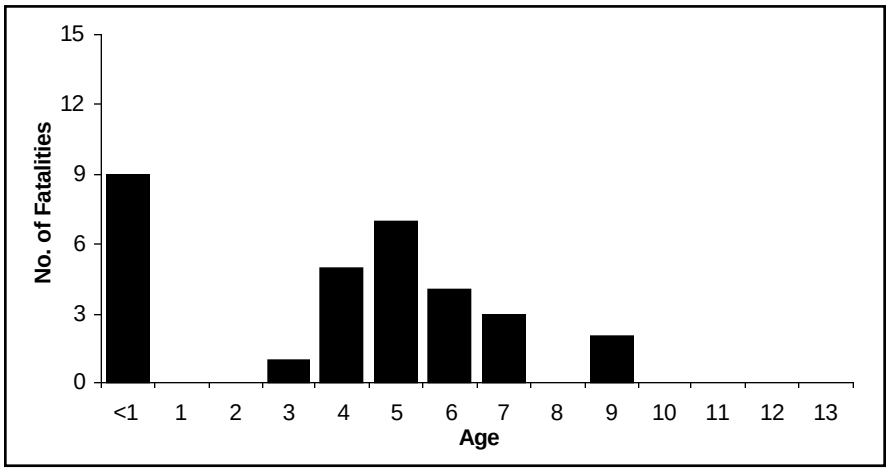

Figure 1. Number of children fatally injured in air bag deployments by age, United States, April 1993 to November 1996.

Background

An understanding of how an air bag works can help in appreciating the problem and its solutions. The air bag itself is nylon fabric folded into a box. Cornstarch "lubricates" the bag for smooth unfolding and may resemble smoke when an air bag deploys. Sensors located near the front of the vehicle and in the front of the passenger compartment trigger deployment in a collision at least equivalent to a crash into a solid barrier at 12 miles per hour. The sensors in the passenger compartment are "safing" sensors designed to distinguish between fender benders and serious crashes. If the crash is violent enough to trigger both sets of sensors, inflation begins. Sodium azide, a solid rocket propellant, is converted to nitrogen gas, which expands to inflate the bag. The entire deployment sequence, from tripping the sensors to full inflation, occurs in 30–55 milliseconds. In less than one second, the air bag begins to deflate. A fully inflated driver air bag is about 28 inches in diameter. Passenger air bags are about three times as large as driver air bags because the distance between the passenger and the dashboard is greater than the distance between the driver and the steering wheel. The passenger air bag must expand faster—and hence with more force—than the driver air bag in order to deploy fully in the same amount of time. Air bags are described as more or less "aggressive" depending on how fast and powerfully they deploy. The faster an air bag deploys, the more aggressive it is said to be.[1]

Although air bags have been in use for a number of years, the increase in the number deployed has accelerated as more vehicles have been equipped with air bags. Federal Motor Vehicle Safety Standard 208, issued by the National Highway Traffic Safety Administration (NHTSA) and amended on July 17, 1984, required that automatic occupant protection, such as air bags **or** automatic belts, be phased into passenger cars between 1987 and 1990. For the most part, motor vehicle manufacturers chose to meet the automatic protection targets with driver air bags rather than automatic belts, and until very recently evaluations of air bag effectiveness in reducing mortality and morbidity were based on driver air bags only.

The Intermodal Surface Transportation Efficiency Act of 1991 put more air bags into use, requiring all passenger cars manufactured after September 1, 1997 and light trucks manufactured after September 1, 1998 to have both driver and passenger air bags, in addition to manual lap-shoulder belts.[2] Currently, more than 60 million vehicles have driver air bags; 27 million of those vehicles also have passenger air bags.[3] By the year 2001, more than half of the vehicles on United States highways—approximately 125 million—will have air bags.[4]

Review of Fatalities

Between April 1993, when NHTSA began investigating air bag fatalities, and November 1996, the agency attributed the deaths of 31 children and 20 adults to air bags.[5] The only air bag related fatality in Missouri occurred in June 1996 when an unbelted 4-year-old was killed.[6]

Most of the 31 children were between the ages of 4 and 7. See Figure 1. Nine were infants in rear-facing child safety seats. Of the remaining children, 18 were not restrained, two were wearing only the lap belt with the shoulder belt behind them, and two were wearing a lap and shoulder belt. See Table 1. Most of these fatalities occurred in low- to moderate-

Table 1. Number of Children Fatally Injured by Air Bag Deployments by Type of Restraint Used, United States, April 1993 to November 1996

Type of Restraint	No. of Fatalities
None	18
Lap belt only	2
Lap and shoulder belt	2
Rear-facing infant restraint	9
Forward-facing child restraint	0
Booster seat	0
Total	**31**

speed crashes. There is no doubt that trauma to the head or neck from the blow of the expanding air bag caused these deaths. Most of the older children killed by air bags died because they were pitched forward near the air bag during pre-crash braking.[7]

Nineteen of the 20 adults whose deaths NHTSA attributed to air bags were drivers, and one was a passenger. All drivers died in crashes of "minor to moderate severity."[8] Seven of the them were age 60 or older. See Figure 2. Ten were women under 5 feet 2 inches tall, and ten were not restrained. See Table 2.

Table 3. Number of Drivers Fatally Injured by Air Bag Deployments by Type of Restraint Used, United States, April 1993 to November 1996

Type of Restraint	No. of Fatalities
None	10
Belts misused	1
Lap and shoulder belt	4
Blacked out and slumped forward due to medical condition (Lap and shoulder belt used)	2
Unknown	2
Total	**19**

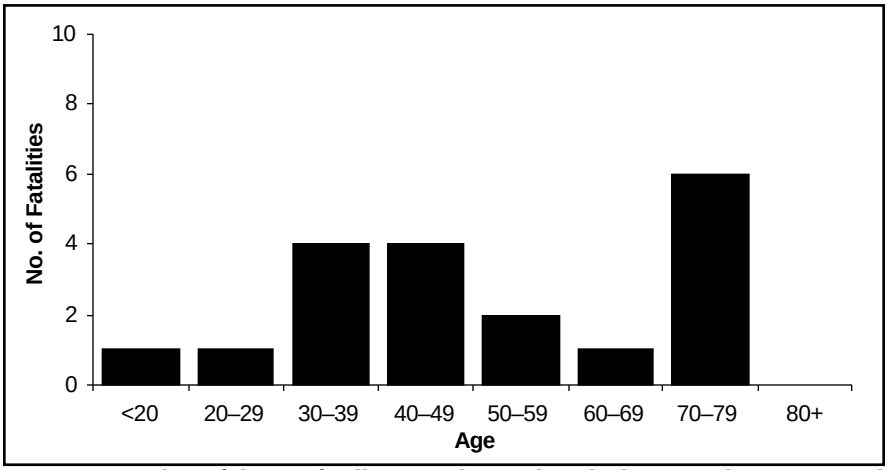

Figure 2. Number of drivers fatally injured in air bag deployments by age, United States, April 1993 to November 1996.

Table 2. Number of Women Under 5 Feet 2 Inches Tall Fatally Injured by Air Bag Deployments by Model Year of Vehicle and Year of Fatality, United States, April 1993 to November 1996

	1989	1990	1991	1992	1993	1994	1995	1996	Total	No. of Vehicles Produced with Driver Air Bags
Model Year 1989							1		1	500,000
Model Year 1990		1			1		1		3	2,500,000
Model Year 1991			1	1			1		3	2,867,000
Model Year 1992					1	1			2	5,084,000
Model Year 1993										7,595,000
Model Year 1994							1		1	9,890,000
Model Year 1995										13,690,000
Model Year 1996										14,321,000
Total		**1**	**1**	**1**	**2**	**1**	**4**		**10**	**56,447,000**

Again, proximity to the air bag at deployment appears to be the major factor. Drivers not wearing lap and shoulder belts were pitched forward onto the steering wheel, where the air bag was housed. See Table 3.

Conclusions

Comparisons of passenger and driver fatalities show sharp distinctions. All of the drivers were adults, while all but one of the passengers were children. Most of the adults died in 1990 and 1991 model vehicles, most of the children in 1994 and 1995 model vehicles. The trend in child fatalities is up. The trend in adult fatalities is down.

The Insurance Institute for Highway Safety's analysis of the effectiveness of passenger air bags indicates that they reduce deaths among right front passengers by 11 percent in all kinds of crashes and by 18 percent in frontal crashes. However, the same study

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(continued from page 19)
concludes that the risk of death for children riding in the front seat is higher in vehicles with passenger air bags than in vehicles without them.[9] NHTSA reaches the same conclusion in its own analysis of crash data.

"For right-front passengers less than 13 years old, analysis of frontal crashes shows a higher fatality risk in cars with dual air bags than for children in comparable cars without passenger air bags. Given the limited data, it is impossible to quantify the increase in risk accurately at this time."[10]

NHTSA's assumptions as to the benefits to be gained from mandating passenger air bags were based on data collected from driver air bags, perhaps without full consideration of the functional differences between driver and passenger air bags, or of the physical differences between adults and children. NHTSA has admitted that as of August 1996, the number of passenger air bags was too small for a statistically significant evaluation of their benefits.[11] For a variety of reasons, even children who are properly restrained are in a dangerous position in relation to an air bag. An infant must ride in a rear-facing child safety seat, which places the head very close to the dashboard, where the air bag is housed. Forward-facing child safety seats also position a child several inches closer to the air bag than an adult passenger would be. Most children who are too old to ride in a safety seat are still too small to have the shoulder belt fit well, and may, therefore, put it behind them. Finally, because most children are shorter than adults, their heads and necks are closer to the air bag.[12]

Because seat belt usage rates were low when air bags were being developed, they were originally designed to protect occupants who were not restrained by belts. Estimated usage of safety belts has more than quadrupled since the early 1980s (from 15 percent to 68 percent) but federal regulation still requires that air bag tests be based on unrestrained test dummies representing 50th percentile males. The speed and force of deployment must be greater to protect unrestrained than restrained occupants. The National Transportation Safety Board has pointed out the inconsistency in NHTSA's efforts to increase safety belt use while continuing to require that air bags meet a standard developed for the protection of unrestrained occupants.[13]

"The Safety Board is concerned that air bag performance certification testing is not based primarily on belted occupants, that pre-impact braking is not considered in the testing procedures, and that testing is conducted with the seat track only in the middle position. By not using belted child occupants and out-of-position child occupants (belted and unbelted), by not considering the effects of pre-impact braking, and by not placing the seat track in the forward-most position, air bag performance testing is not representative of actual accident environments."[13]

Solutions

Parents must learn never to put a rear-facing infant seat in the front seat of a car with a passenger air bag. All children under 12 should ride properly restrained in the back seat. Short drivers, especially if they are elderly, should move the vehicle seat as far back as possible while still maintaining control. Pedal extenders can be installed to enable them to reach floor controls.

Passenger Safety

Regardless of whether a car has an air bag, ensure that all passengers ride safely by following these rules:

- **All children under the age of 12 years** should ride in the back seat.
- Make sure **everyone** is using the appropriate safety restraints.
- **Infants** must always ride in a rear-facing safety seat, placed in the rear of the car, until they weigh 20 pounds and are 1 year of age.
- **Toddlers** should ride in convertible seats until they weigh 40 pounds or are 40 inches tall.
- **Preschool and early elementary school children** should ride in a belt-positioning booster seat until they weigh 60 pounds.
- **Older children** must wear the lap belt low on the hips and the shoulder belt across the shoulder and collar bone.

Adapted from the 1996 National Highway Safety Administration flyer, *The Air Bag That Saves Your Life Could Kill Your Child*, by Ricardo Martinez, M.D. Reprinted with permission from *Disease Prevention News* published by Texas Department of Health.

Interim mechanical solutions include cutoff switches and deactivating air bags. Some light trucks and sports cars in which a rear-facing infant safety seat can only be used in the front seat are now manufactured with switches that enable the passenger air bag to be turned off. NHTSA is extending the time such switches can be installed until September 2000. NHTSA is also considering allowing automobile dealers to de-activate an air bag at the customer's written request.[14]

The initial change in air bag functioning will be a reduction in power, but first the crash test standards must be modified. NHTSA may raise the maximum forces allowable on the chest area of crash test dummies or substitute a sled test for the crash test into a fixed barrier. Either change would be intended to allow air bags to be "depowered" by about 30 percent. The sled test uses a vehicle body mounted on rails to mimic a crash instead of crashing the car into a fixed barrier. Automobile manufacturers maintain that the sled test better replicates real crashes, in which vehicles usually hit other vehicles rather than solid barriers, because it provides longer deceleration time.[14]

The long-term solution is a "smart" air bag that adjusts deployment according to occupant size, occupant position, belt use and crash severity. Mercedes has already introduced a rudimentary smart air bag and child safety seat combination. A sensor in the passenger seat deactivates the air bag when it reads a magnetic tag on the base of the safety seat. More widely applicable smart air bags are several years away. Systems under development include weight-sensing systems and multi-beam ultrasonic systems to recognize the differences among occupants. However, NHTSA is only now attempting to define what a smart air bag can be, and no manufacturer will bring a product to market that does not meet federal standards.[15] Meanwhile, injury prevention advocates must continue informing the public about the dangers of air bags while working for a long-term solution.

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TELECONFERENCE

Epidemiology and Prevention of Vaccine-Preventable Diseases

The Centers for Disease Control and Prevention will present the satellite course, "Epidemiology and Prevention of Vaccine-Preventable Diseases" on four consecutive Thursdays: June 5, 12, 19 and 26. The time for the teleconference has not yet been determined. Please mark the dates on your calendar and watch for the registration form in the mail.

The session on June 12 will cover the significant changes in pertussis and polio vaccines, including discussion of newly licensed acellular pertussis vaccines and the new sequential IPV/OPV recommendations. Individuals who have previously participated in the the full Epidemiology and Prevention of Vaccine-Preventable Diseases course are encouraged to attend this special session to obtain the latest, most up-to-date information on these topics.

For more information about the course, or for site locations, contact your district immunization representative or the Bureau of Immunization at (573) 751-6133.

Immunization Rates

(continued from page 17)

A Commitment to the Future

The immunization compliance rate rose dramatically during 1995. The end of 1995 saw a compliance rate of 87.3 percent for those 2 years of age and younger. This is a significant increase over the 57.5 percent rate for 1994. This large increase is directly attributable to the efforts of the Springfield/Greene County Health Department and the organizations that helped make the program a success.

The task force continues to develop strategies to increase immunization rates. The immunization program has been considered a model program, a fact that led Governor Carnahan to sign the recently enacted immunization legislation at the Center for Immunization Services in Springfield. We have been asked to consult with other health departments to assist them in developing strategies to increase their immunization rates.

Through random customer service evaluations of our program, we have determined that there is a much greater level of customer satisfaction with our immunization clinic, which we believe has contributed to the increase in volume, utilization and corresponding rise in immunization rates.

The task force will continue to meet and has set a goal of 95 percent compliance in 2-year-olds by the year 2000. This has also become a priority within the community which is reflected in the missions of the Community Task Force, Caring Communities, Greene County Medical Association and other civic organizations. This process has shown what can be accomplished by partnering energy and resources of the public and private sectors.

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LATE BREAKERS

- The Department of Health Bulletin Board Service (BBS) will be going down effective January 1998. More details on alternative options will be presented in future issues. If you have questions, please call Michael Fobbs at (800) 392-0272.

- The Bureau of Immunization, along with the State Public Health Laboratory, began utilizing the IgM capture ELISA test for measles on April 14, 1997. Although this test is expensive, it will greatly reduce the number of false positives and, therefore, will be more cost effective.

  For more accurate results, blood specimens should be collected >3 days after onset of rash. The sensitivity of the test will be 100% if the specimen is collected >3 days after onset of rash and only 85% if collected before the third day of rash onset.

  If you have questions about this testing, please contact Georgia Storm in the Bureau of Immunization at (573) 751-6133.

- The school immunization rule has been amended to allow 28 days between the required first and second doses of measles vaccine.

  Another change in the school immunization rule for school year 1997-98 now requires three hepatitis B vaccinations before kindergarten.

  For more information, contact the Bureau of Immunization at (573) 751-6133.

Department of Health Internet Access

The Department of Health recently revamped its homepage to be more user friendly. Items added to the homepage include:

- Statistical profiles for the state and individual Missouri counties
- Communicable disease information
- Prevention and Wellness Directory
- How to obtain birth and death certificates.

The statistical profiles provide information by county on:

- Causes of death
- Socio-economic indicators
- Causes of hospitalizations
- Hospitals
- Nursing homes
- Population estimates
- Maternal and child health status indicators
- Communicable diseases.

The Prevention and Wellness Directory includes information on family health, nutrition services and smoking and tobacco education.

The homepage offers access to recent Department of Health news releases and publications. A search feature allows you to search by topic.

Futher additions to the department homepage are ongoing. Items being discussed for inclusion are disease treatment guidelines, educational brochures, biennial report of reportable diseases and conditions, disease fact sheets, etc. Some additions to expect soon are:

- Organizational chart
- Meeting notices
- Job announcements
- Requests for Funding

The Department of Health homepage can be accessed at www.health.state.mo.us.

The *Missouri Epidemiologist* is also available through the department homepage or directly at www.health.state.mo.us/cgi-bin/uncgi/MoEpi. Issues back through 1992 are available in pdf format. Future issues will also be available in html format. We plan to add indexes to past issues as separate documents for your convenience in locating articles.

Take time to explore the Department of Health homepage and let us know what additional information should be added. We welcome your comments in our continuing effort to improve the homepage to suit your needs. If you have questions or comments, please call Harold Kirbey at (573) 751-6219 or e-mail him at kirbeh@mail.health.state.mo.us.

State Public Health Laboratory Report

Newborn Screening—Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Jan 97	Feb 97	Total YTD
Specimens Tested	9,730	8,677	18,407
Initial (percent)	64.2%	64.3%	11,827
Repeat (percent)	35.8%	35.7%	6,580
Specimens: Unsatisfactory	213	233	446
HT Borderline	951	859	1,810
HT Presumptive	22	15	37
PKU Borderline	1	0	1
PKU Presumptive Positive	1	0	1
GAL Borderline	28	44	72
GAL Presumptive Positive	3	0	3
FAS (Sickle cell trait)	85	61	146
FAC (Hb C trait)	29	18	47
FAX (Hb variant)	14	12	26
FS (Sickle cell disease)	2	0	2
FSC (Sickle C disease)	2	0	2
FC (Hb C disease)	0	1	1

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

Upcoming Conference

THE ESSENTIALS OF INFECTION CONTROL
7TH ANNUAL CONFERENCE

September 24–26, 1997
Capitol Plaza Hotel, Jefferson City, MO

Purpose:
This conference is a **STARTING POINT** to prepare healthcare professionals as facilitators and resource persons in the prevention and control of common nosocomial infections. It will aid the professional **new to the responsibilities of infection control** to manage the everyday responsibilities of infection surveillance, analysis of disease data, and problem identification and resolution. Important resources for assistance will also be shared.

Sponsors:
Missouri Department of Health, Missouri Hospital Association, Missouri APIC Chapters and several other organizations.

Registration:
For a complete conference brochure and registration form, call (573) 751-6115.

Who Should Attend:
You should attend this conference if you are a healthcare professional **NEW** to the field or the tasks of an infection control professional, or someone who assists with:

- the infection control program in any healthcare setting (acute care, ambulatory care, home health, long term care, mental health, public health, rehabilitation, other)
- consultation on infectious disease prevention and control
- outbreak investigation and follow-up
- surveys, investigations or licensing activities relevant to infection control practices.

Experienced infection control professionals will find DAY 3 of the conference beneficial.

Missouri EPIDEMIOLOGIST

Volume 19, Number 3 *May-June 1997*

Vaccine-Preventable Disease 1996 Annual Report

Susan Denny
Bureau of Immunization

State health officials in Missouri have been documenting cases of various communicable diseases for more than a century. The State Board of Health reported cases of diphtheria, scarlet fever and typhoid in its annual report as early as 1888. By 1921, the Board systematically kept records for 27 diseases. In 1939, the Missouri Legislature enacted a law giving the Board statutory authority to collect information on diseases that are a threat to public health. In 1948, that law was further defined by a rule that listed the diseases that would be monitored and the precautions for each. Since that time, the Department of Health has periodically amended the list of reportable diseases to reflect concerns about emerging pathogens.

Over the past several decades, effective vaccines have been developed for many diseases that are life threatening or can result in serious long-term complications. The mission of the Bureau of Immunization is to ensure that these vaccines are widely distributed in order to prevent, control and eliminate vaccine-preventable diseases in Missouri. As vaccines become available and accessible to the general public, it is essential to develop and maintain a surveillance system that continues to track the incidence of these diseases.

"Surveillance of disease is the continuing scrutiny of all aspects of occurrence and spread of a disease that are pertinent to effective control," according to *Control of Communicable Diseases in Man*, 16th Edition, published by the American Public Health Association in 1995. A good surveillance system provides complete and accurate reporting that can identify individuals and communities that have not been immunized adequately. The data can also lead to better information about the efficacy of specific immunizations and, ultimately, to better control and even elimination of vaccine-preventable diseases.

The Bureau of Immunization manages the surveillance system that reports vaccine-preventable diseases in Missouri. It collaborates with the Missouri State Public Health Laboratory, local health departments and private providers to collect information on suspected cases of vaccine-preventable diseases. If the State Public Health Laboratory confirms a report of such a disease, the bureau determines a zone of risk. Active surveillance is maintained for everyone in this zone of risk—family and neighborhood contacts and, for cases among school children, exposure through contacts such as in the classroom, at sporting events and on buses. Immunization histories are obtained and susceptible persons are immunized. Any cases of disease that are discovered are transmitted weekly to the Centers for Disease Control and Prevention (CDC) through the National Electronic Telecommunications Surveillance System (NETSS). In addition, the bureau annually reviews death certificates to determine mortality due to vaccine-preventable diseases.

The surveillance system is entirely dependent upon the cooperation of private providers and local public health agencies who report to the Department of Health. The department relies upon the expertise of clinicians to identify probable cases and submit specimens to

(continued on page 2)

Inside this Issue...

(continued from page 1)
the State Public Health Laboratory for appropriate testing. We thank those reporters who are cognizant of the significance of this system for their efforts in providing complete and accurate information on all suspected cases of vaccine-preventable diseases.

During 1996, 74 cases of pertussis (whooping cough) were reported, an increase from 63 cases in 1995. There were no deaths from pertussis. Cases occurred in all health districts of the state and did not appear to be epidemiologically linked. Fifty-one (38) percent of the cases occurred in infants 6 months of age and under. Twenty-eight (21) percent of the cases occurred in children aged 1 to 18 years and 20 (15) percent occurred in children aged 6 months to a year. Table 1 describes the results of the testing of pertussis specimens submitted to the State Public Health Laboratory during 1996.

Cases of pertussis continue to occur, though only in part because of incomplete immunization coverage. Multiple doses of vaccine and regular boosters are required for children under 7 years of age in order to produce and retain immunity. Immunity wanes over time, so infants who are not fully immunized may be infected by older children and adults. It is not recommended that persons over age 7 receive routine vaccination because vaccine reactions are thought to be more frequent and because pertussis-associated morbidity and mortality decrease with age. When outbreaks occur, antibiotics are used to control the disease among older children and adults; vaccine has limited usefulness in these situations.Continued research must be done to develop a pertussis vaccine that is safe and effective for those over 7 years of age. DTaP, which contains the acellular pertussis vaccine, is being investigated for this purpose.

In 1996, there were three reported cases of measles (rubeola), compared with two cases in 1995. Two of the three positive cases in 1996 were 25-year-old males who had traveled to Las Vegas and were epidemiologically linked to an outbreak there. The other case was isolated, and involved a 29-year-old male. No source of infection was identified. There were no reported cases of rubella in Missouri in 1996.

One nonfatal case of tetanus was reported during 1996 in a 75-year-old retired farmer who had no prior history of receiving the tetanus toxoid.

Surveillance of preventable diseases is essential to the initiation of interventions that stop the spread of disease. It is important that immunization rates in Missouri continue to rise to, and then be maintained at, a level higher than the 76 percent that we have currently achieved.

The Department of Health is working with both public and private providers to reach the goal of completely immunizing 90 percent of Missouri's 2-year-olds by September 1997. Identifying all cases of vaccine-preventable disease, together with accompanying demographic information, will greatly assist the department as it seeks to better target its immunization efforts in the future.

Table 1. Missouri Pertussis Specimens Submitted to the Missouri State Public Health Laboratory, 1996

Month	Total Specimens Received	Total Positive Cases	Percent Positive
January	105	1	1.0
February	58	1	1.7
March	71	2	2.8
April	40	4	10.0
May	75	6	8.0
June	44	5	11.4
July	53	6	11.3
August	64	15	23.4
September	48	4	8.3
October	66	5	7.6
November	86	16	18.6
December	144	9	6.3
Total	**854**	**74**	**8.7**

TELECONFERENCE

Immunization Update 1997

The Centers for Disease Control and Prevention will present the satellite broadcast, "Immunization Update 1997," on September 11, 1997. The time for the conference has not yet been determined.

This 2.5 hour live interactive program will provide updates on: new vaccines and vaccine combinations; polio vaccine and global polio eradication; rotavirus vaccine; new recommendations from the Advisory Committee on Immunization Practices (ACIP) for measles, hepatitis B, pneumococcal and influenza vaccines; and why and how to assess the immunization rates in your practice. The broadcast will feature a question and answer session in which participants nationwide can interact with the course instructor via toll-free telephone lines.

This session is designed for physicians, nurses, physician assistants, pharmacists, medical students, nurse practitioners and their colleagues in both the public and private sectors who give immunizations or set policy for their offices or clinics.

Continuing education credit will be offered for a variety of professions, based on 2.5 hours of instruction. ACPE pharmacy continuing education accreditation (0.25 contact hours) is pending approval.

For more information about the course or for site locations, contact the immunization representative in your district health office or the Bureau of Immunization at (573) 751-6133.

Animal Rabies Surveillance - 1996

F. T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

Missouri continues to experience a low incidence of rabies activity, with only 26 cases of animal rabies in 1996. The 26 cases of rabies were derived from examining 1,915 satisfactory specimens. The 26 cases occurred in 12 counties, with Howell county accounting for 11 of the cases.

Missouri has two reservoirs for rabies: the skunk, which is affected with two different strains, and the bat. Twelve of the 26 cases were in skunks; 11 of them from Howell County. It is of interest that the counties surrounding Howell County did not detect any wildlife rabies. Douglas and Howell counties each had a case of bovine rabies. Two other counties had rabies cases in cats (McDonald and Greene) and a dog (Greene), yet did not detect rabies in the wildlife animal reservoir. The nine other cases of rabies were in the bat species and originated from Benton, Buchanan, Jefferson, St. Charles and St. Louis counties.

For the past seven years Missouri has averaged only 31 rabies cases per year. This low prevalence of rabies in Missouri is generally attributed to the low skunk population in the state. Since skunks are the main reservoir for rabies in Missouri, any fluctuation of population or disease in these animals affects the overall rabies picture in the state.

While the number of animal rabies cases has remained low for several years, Missouri continues to be endemic for rabies. The low number of rabies cases can, in part, be attributed to the passive surveillance system, particularly of the wildlife species. Many counties continue to experience difficulty in transporting rabies specimens to the three state laboratories. Credit, however, must be given to Missouri communities for practicing the Cardinal Rules of Rabies Control (see sidebar on this page). Following these rules has proven successful in controlling rabies.

Cardinal Rules of Rabies Control

- All dogs, cats and ferrets should be professionally vaccinated.
- A program of stray animal control should be instituted.
- Individuals should be instructed to stay away from wild and stray animals.
- **All** animal bites should be medically evaluated.

In a rabies endemic area, animal bites or scratches should be reported to either public health or private medical authorities for evaluation and possible post-exposure rabies treatment. This treatment consists of rabies immune globulin and five doses of rabies vaccine. The treatment is considered most efficacious and relatively painless. It is, however, an expensive procedure. The cost of professional vaccination of a dog, cat or ferret and the application of observation periods for these animals is minimal in comparison to the $1,200 to $1,500 cost of human post-exposure treatment.

It is essential that the need for rabies post-exposure treatment of individuals exposed to bats be evaluated very carefully. When asked whether they have been bitten by an animal, most people visualize an open bleeding wound. Because of the miniature nature of bats' teeth, this is not the picture presented after a bat bite. This is especially true in a child's recollection of a bite. Special precautions should be exercised by medical personnel in evaluating bat exposures. When a bat is present and the reasonable possibility of a bite or scratch cannot be excluded, post-exposure treatment should be considered unless diagnostic tests are negative.

Based on the latest evidence of the danger of bat rabies to humans, a reeducation of the public is necessary. The general prevention rule is, **stay away from bats**. Do not invite them into your house nor your back yard.

In 1996, all 96 bats submitted to the State Public Health Laboratory in Jefferson City for rabies testing were speciated to learn which species are being affected in Missouri. Seven species were identified. They are: Big Brown 55 specimens, Red 21, Hoary 6, Evening 6, Eastern Pipistrelle 3, Little Brown 2, Silver-Haired 2, and Indiana 1 specimen. Three of the Big Brown and one of the Hoary bats were positive. The other five positive bats in Missouri were tested at the state public health laboratories in Poplar Bluff and Springfield. Collection of species-specific information over time will provide valuable data, which will assist in the evaluation of the need for post-exposure rabies treatment after bat exposure.

Bureau of Communicable Disease Control 1996 Annual Report

Michael Fobbs, B.A.
Bureau of Communicable Disease Control

Cryptosporidiosis was made reportable in Missouri effective April 30, 1996. There were 35 cases of cryptosporidiosis reported in 1996. The largest number of cases (14, or 40.0%) was reported from the Southeastern Health District during a period of enhanced surveillance of nursing home populations for cryptosporidiosis. The Eastern Health District reported the second highest number of cases (10, or 28.6%) during normal surveillance. All reports were individual cases; there were no reported outbreaks of cryptosporidiosis during 1996.

Enteric Disease

There were 74 *E. coli* O157:H7 cases reported during 1996, a 54.2 percent increase over the 48 cases reported in 1995. The number of reported cases increased in all districts except the Central Health District. The highest number of cases (29, or 39.2%) was reported from the Eastern Health District, possibly due to the fact that St. Louis Children's Hospital routinely tests for this pathogen. The second highest number of cases (15, or 20.3%) was reported from the Southwestern Health District where St. John's Regional Health Center in Springfield also routinely tests for *E. coli* O157:H7, and where efforts have been made to educate laboratory staff and hospitals about *E. coli* as a cause of diarrheal illness. See Figure 1. *E. coli* infection was made reportable in Missouri in mid-1992, and 1996 is the fourth complete year of reporting. By 1998, with more than five years of data available, the analysis of trends for this disease will be more meaningful. There is still significant under-detection and under-reporting of this pathogen in Missouri, which prospective studies in other states have found to be more common than *Shigella*.[1]

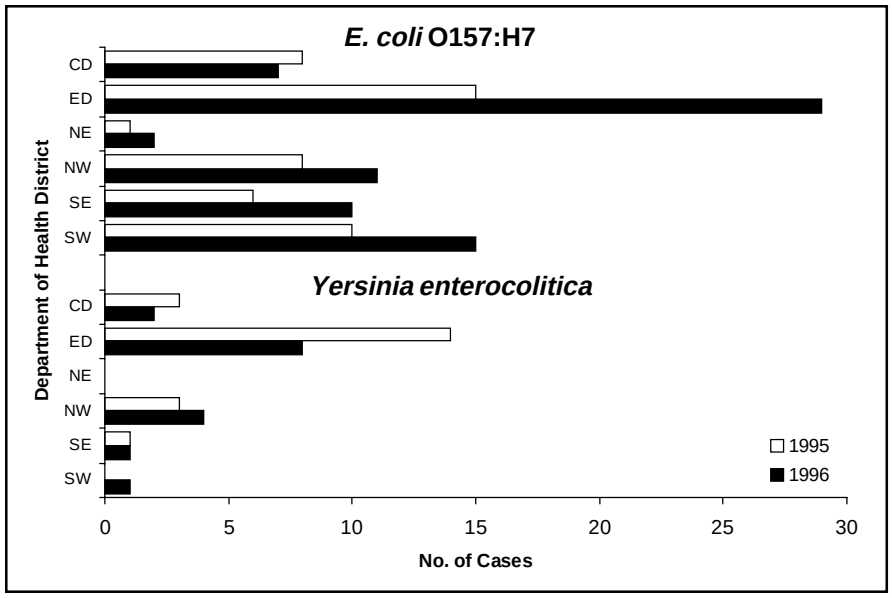

Figure 1. Reported *E. coli* O157:H7 and *Yersinia enterocolitica* cases by Department of Health District, Missouri, 1995 and 1996.

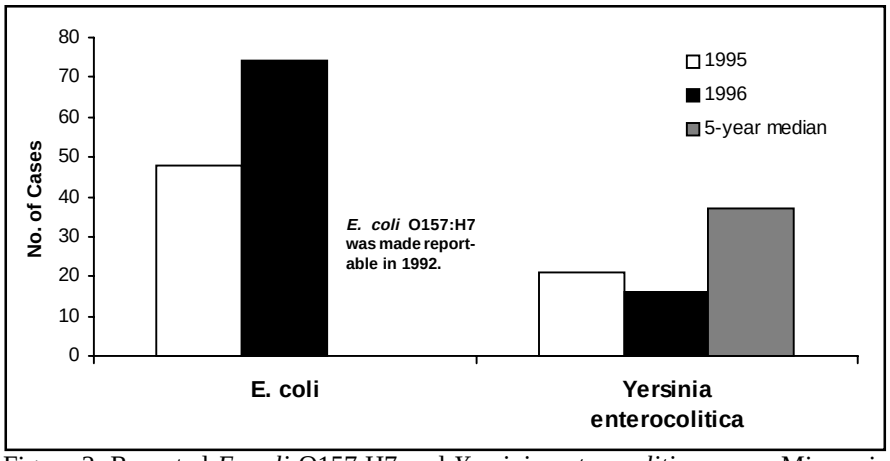

Figure 2. Reported *E. coli* O157:H7 and *Yersinia enterocolitica* cases, Missouri, 1995, 1996 and five-year median.

The number of reported cases of campylobacter infection decreased from 601 cases in 1995 to 554 cases in 1996, a decline of 7.8 percent. The Northeastern Health District showed an increase in the number of reported cases, the Southeastern Health District showed no change and the other health districts all showed decreases. See Figure 3. The

Key to Department of Health Districts:

CD = Central Health District
ED = Eastern Health District
NE = Northeastern Health District
NW = Northwestern Health District
SE = Southeastern Health District
SW = Southwestern Health District

1996 incidence was 9.8 percent below the five-year median* of 614 cases. See Figure 4.

The number of reported cases of salmonellosis fell 2.0 percent from 577 cases in 1995 to 565 cases in 1996. There was a large decrease (23.4 %) in the number of cases reported from the Southeastern Health District, and a large increase (24.3 %) in the number of cases reported from the Southwestern Health District. All other health districts showed a decrease in the number of cases reported in 1996. See Figure 3. The 565 cases reported in 1996 were 2.0 percent below the five-year median of 577 cases. See Figure 4. The most common serotypes of salmonella reported in 1995 and 1996 are shown in Table 1 on page 29.

Reported cases of shigellosis decreased dramatically by 66.0 percent in 1996, from 1,138 cases in 1995 to 387 cases in 1996. Decreases in the number of cases reported were seen in the Northwestern Health District (a 79.6 percent reduction), the Eastern Health District (a 68.1 percent reduction), the Central Health District (a 62.5 percent reduction) and the Southwestern Health District (a 56.8 percent reduction). These four districts went from a total of 1,064 cases reported in 1995 to 300 cases in 1996. The number of reported cases from the Northeastern Health District increased from 8 to 22 reported cases in 1996. The Southeastern Health District showed little change from 1995 to 1996. The 1996 incidence was 42.6 percent lower than the five-year median of 674 cases. See Figure 4.

The number of reported cases of *Yersinia enterocolitica* decreased 23.8 percent from 21 cases in 1995 to 16 cases in 1996. The 1996 incidence was 56.8 percent below the five-year median of 37 cases. See Figure 2. As in the past, the largest number of cases was reported among black children in the Eastern and Northwestern health districts. See Figure 1.

(continued on page 6)

* The five-year median was calculated using the annual totals from 1991–95.

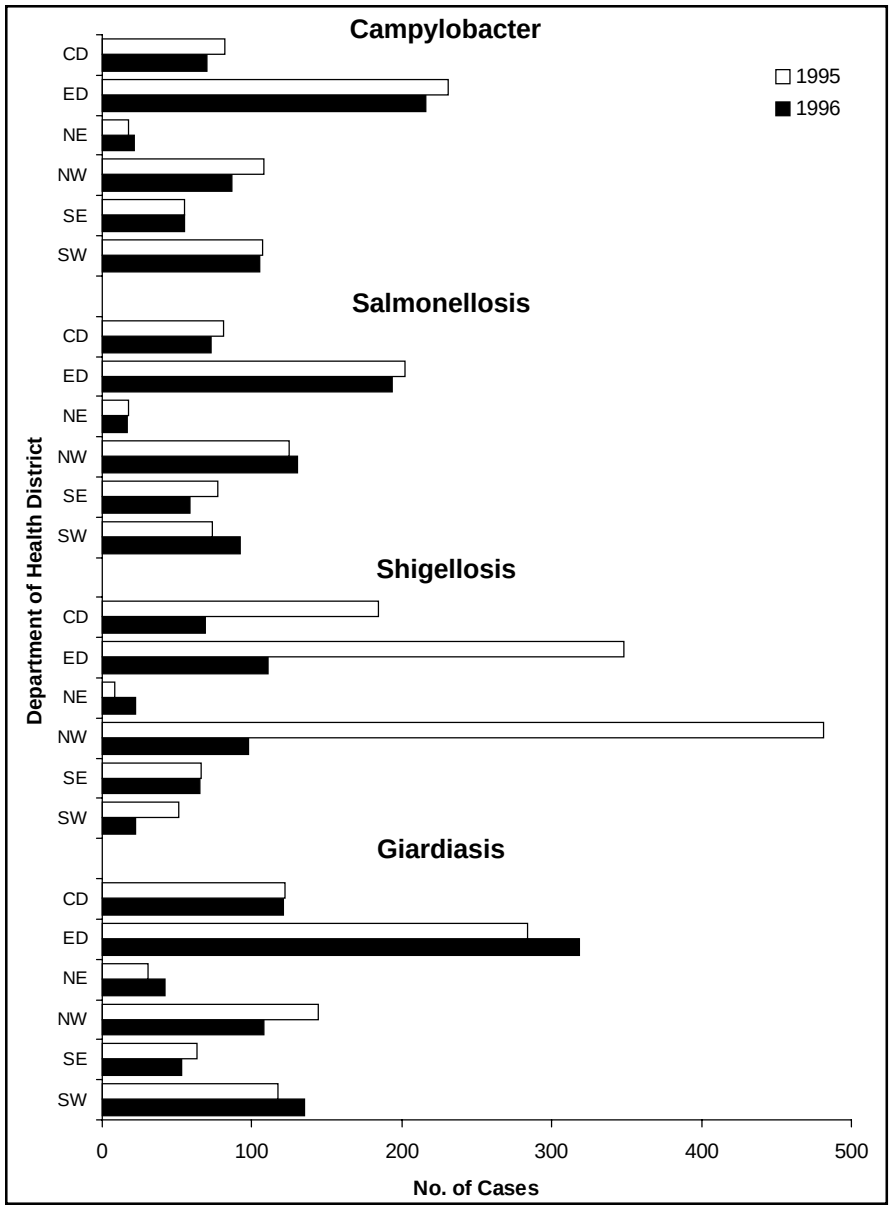

Figure 3. Reported campylobacter, salmonellosis, shigellosis and giardiasis cases by Department of Health District, Missouri, 1995 and 1996.

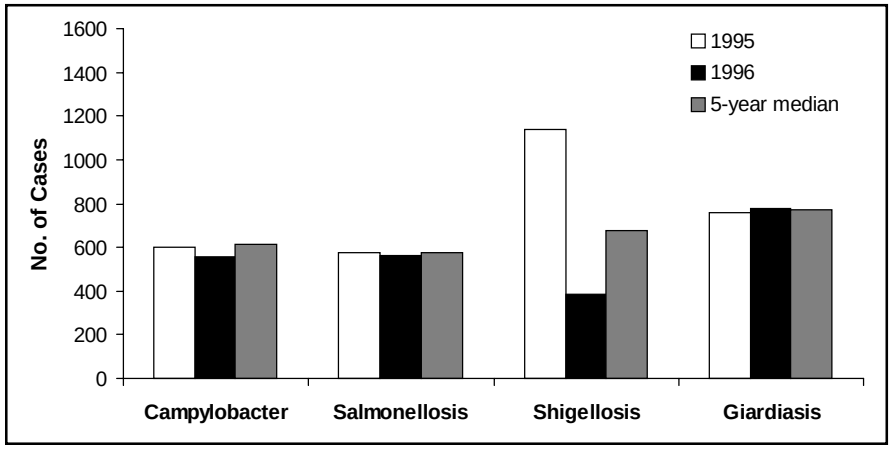

Figure 4. Reported campylobacter, salmonellosis, shigellosis and giardiasis cases, Missouri, 1995, 1996 and five-year median.

(continued from page 5)

Parasitic Disease

Giardiasis is one of the few other parasitic diseases which the Department of Health routinely tracks through its surveillance system. Reported cases of this disease increased slightly by 2.1 percent, from 761 cases in 1995 to 777 cases in 1996. The numbers of cases reported from the Eastern, Northeastern and Southwestern health districts all increased, but the numbers reported from the Northwestern and Southeastern health districts decreased during 1996. There was only a slight decrease in the number of cases reported from the Central Health District. See Figure 3. The 1996 incidence was 0.9 percent above the five-year median of 770 cases. See Figure 4.

Viral Hepatitis

Hepatitis A in Missouri increased by 5.7 percent from 1,338 reported cases in 1995 to 1,414 cases in 1996. The largest number of cases, 629 (44.5%) was reported from the Southwestern Health District, an increase of 395.3 percent over the 127 cases reported in 1995. Increases in the number of cases reported were also seen in the Northeastern and Southeastern health districts. A large decrease was seen in the Central and Northwestern health districts, and a small decrease was seen in the Eastern Health District. See Figure 5. The 1996 incidence was 5.7 percent above the five-year median of 1,338 cases. See Figure 6.

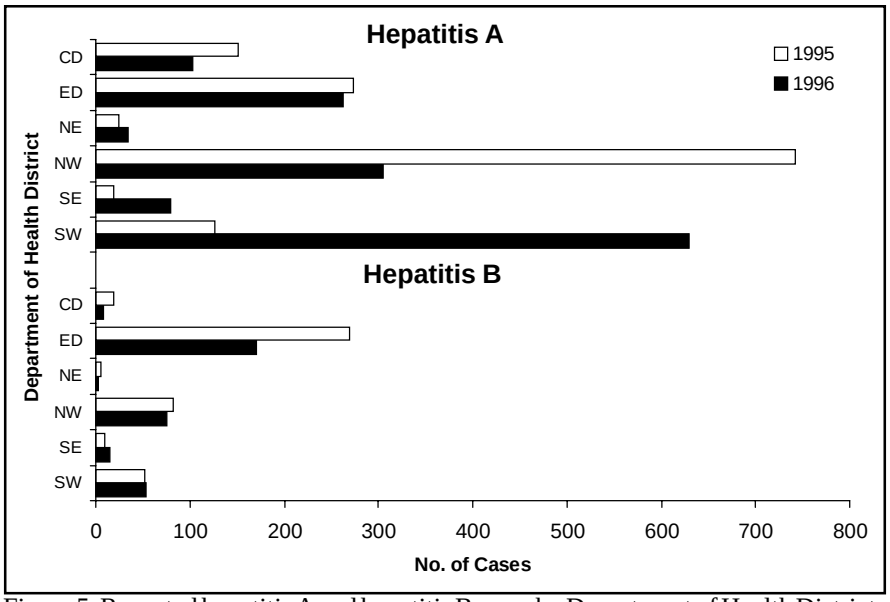

Figure 5. Reported hepatitis A and hepatitis B cases by Department of Health District, Missouri, 1995 and 1996.

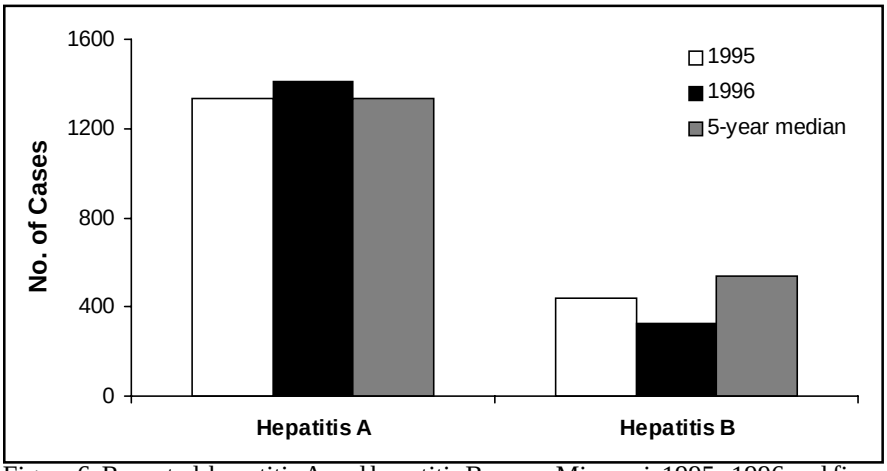

Figure 6. Reported hepatitis A and hepatitis B cases, Missouri, 1995, 1996 and five-year median.

Only 71 (5.0%) of the 1,414 hepatitis A cases reported in 1996 were associated with outbreaks. (See separate article regarding outbreaks on pages 8–9.) The majority of the cases reflect ongoing transmission of this disease in large areas of the state.

Hepatitis B cases decreased by 25.4 percent, from 437 cases reported in 1995 to 326 cases in 1996. Two health districts, Southeastern and Southwestern, had slight increases in the number of cases reported in 1996. All the other health districts showed decreases in the number of reported cases. See Figure 5. The 1996 incidence was 39.4 percent lower than the five-year median of 538 cases. See Figure 6.

Meningococcal Meningitis and Other Invasive Meningococcal Disease

There was a 5.5 percent increase in the number of reported cases of meningococcal meningitis, from 54 cases in 1995 to 57 cases in 1996. This is the sixth year of increasing incidence. The Eastern, Northwestern and Central health districts all had increases in the number of reported cases in 1996. See Figure 7. The largest numbers of cases reported were from the health districts that include the state's two major metropolitan areas: 27 cases from the Eastern Health District and 14 cases from the Northwestern Health District. The 1996 incidence was 54.1 percent above the five-year median of 37 cases. See Figure 8.

Other invasive meningococcal disease increased by 86.4 percent from 22 reported cases in 1995 to 41 cases in 1996. The numbers of cases reported increased in all health districts except the Northwestern and Southwestern. The number of cases reported from the Southeastern Health District went from 2 cases in 1995 to 12 cases in 1996. Data on other invasive meningococcal disease has only been collected since 1994.

Aseptic Meningitis

Aseptic meningitis decreased by 55.4 percent from 269 reported cases in 1995 to 120 cases in 1996. See Figure 8. Decreases in the number of reported cases were seen in all health districts. The largest decline occurred in the Southwestern Health District, where reported cases decreased by 83.3 percent (78 to 13 cases). See Figure 7. The 1996 incidence was 56.4 percent lower than the five-year median of 275 cases.

Aseptic meningitis is a disease of unknown etiology with many different causes. Surveillance of clusters/outbreaks of this disease is important because of the need to determine the causative organisms and transmission modes.

Haemophilus influenzae type b (Hib) Disease

There were no cases of Hib meningitis reported in 1996. Ten cases were reported in 1995 and seven cases in 1994. The 1996 incidence was 100 percent lower than the five-year median of 12 cases. See Figure 8.

Reported cases of invasive Hib disease other than meningitis decreased by 55.5 percent, from 18 cases in 1995 to 8 cases in 1996. See Figure 8. The number of reported cases decreased in all health districts, except the Central and Northeastern. See Figure 7. The 1996 incidence was 81.8 percent below the five-year median of 44 cases. Reported cases of invasive Hib disease other than

(continued on page 29)

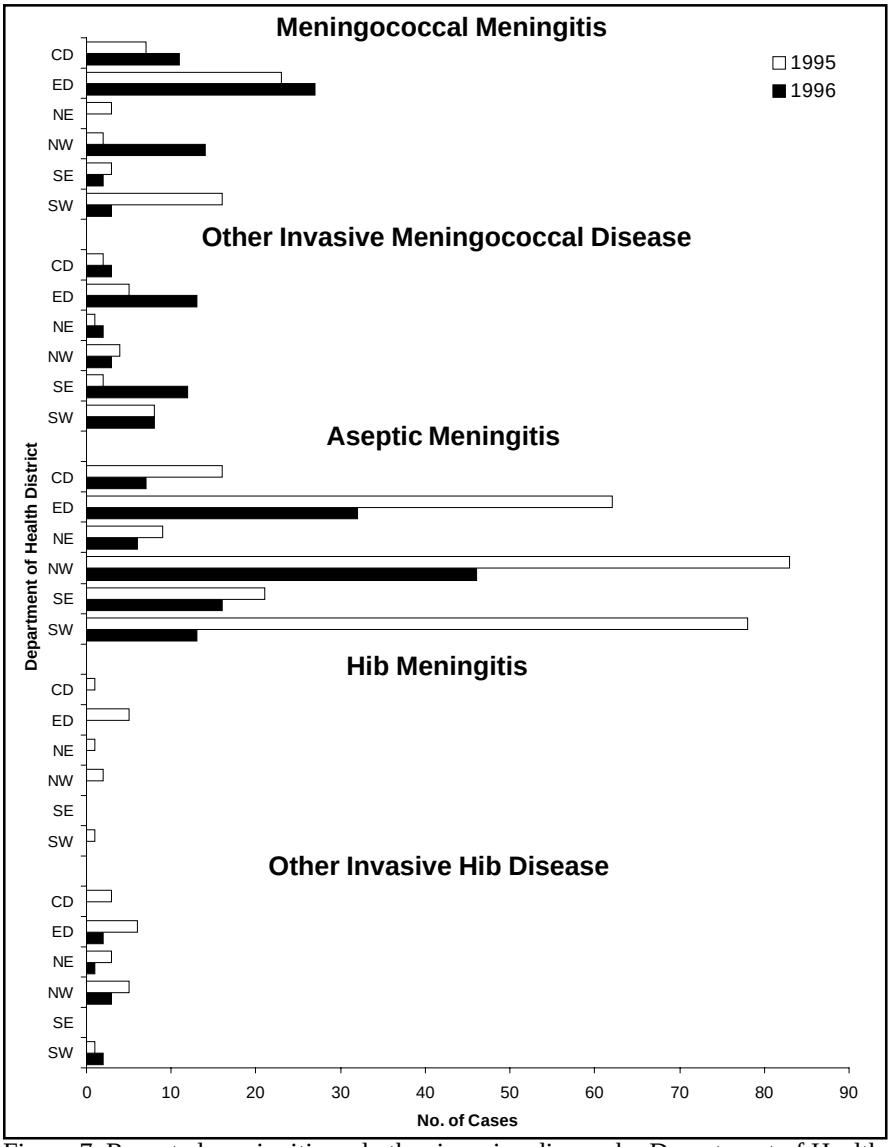

Figure 7. Reported meningitis and other invasive disease by Department of Health District, Missouri, 1995 and 1996.

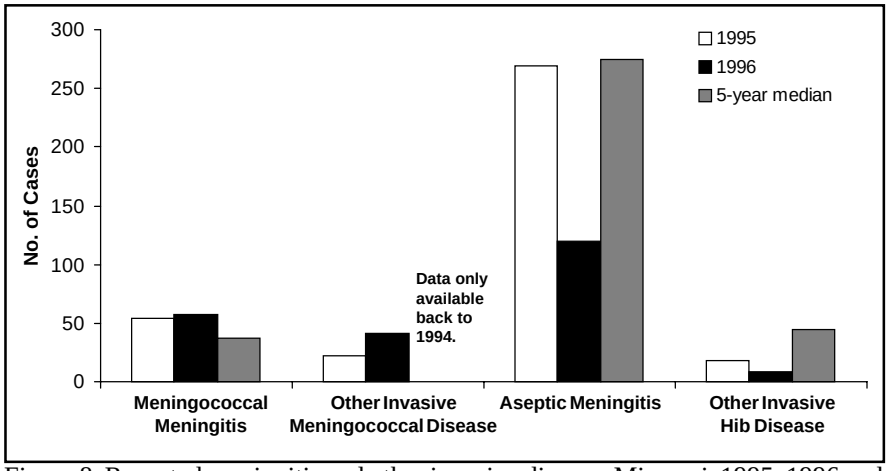

Figure 8. Reported meningitis and other invasive disease, Missouri, 1995, 1996 and five-year median.

1996 Outbreaks of Communicable Disease*

Michael Fobbs, B.A.
Bureau of Communicable Disease Control

In 1996, there were 40 communicable disease outbreaks reported in Missouri. This represents a 20.0 percent decrease from the 50 outbreaks reported in 1995. However, the 40 outbreaks reported in 1996 affected 1,627 people, compared to 880 persons affected by the 50 outbreaks reported in 1995. The outbreaks in 1996 involved several different modes of transmission and a number of widely varying etiologic agents, and they occurred in a variety of settings. The modes of transmission were as follows: 27 outbreaks were suspected to have resulted from person-to-person transmission, 11 were foodborne, one was waterborne, and in one outbreak the mode of transmission was aerosolization of sump water.

Communities and correctional institutions were the most common settings for outbreaks reported in 1996, each accounting for eight (20.0%) outbreaks. Schools and restaurants were the second most common locations, accounting for seven outbreaks (17.5%) each. Day care settings were involved in six outbreaks (15.0%) and two outbreaks (5.0%) occurred in camps (including the annual Rainbow Family Gathering) . Individual outbreaks occurred in a bar and a group home (2.5% each). The largest single occurrence was an outbreak of influenza-like illness in a school affecting 1,050 people. Table 1 lists the communicable disease outbreaks that occurred in 1996 by etiology, setting and number of cases.

The largest proportion of the outbreaks reported during 1996 was involved acute gastrointestinal illness of unknown etiology (AGI), with eleven outbreaks affecting 245 people. Foodborne transmission was the most common mode, being implicated in nine (81.8%) of these outbreaks. The other two AGI outbreaks were the result of person-to-person transmission. AGI outbreaks occurred in the following settings: five restaurants, three schools, two institutions and one group home. Viral etiology is suspected for these outbreaks but laboratory confirmation was not possible.

Outbreaks due to bacterial enteric diseases (regardless of etiology) were very common during 1996. Nine outbreaks were associated with these

Table 1. Communicable disease outbreaks by etiology, setting and number of cases, Missouri, 1996.

Disease/ Mode of Transmission	No. of Outbreaks	Setting	No. of Cases
Acute Gastrointestinal Illness of Unknown Etiology			
Foodborne	9	I, O, 5R, 2S	145
Person-to-Person	2	I, S	100
Shigellosis			
Person-to-Person	4	3DC, S	56
Waterborne	1	CA	68
Hepatitis A			
Foodborne	1	R	4
Person-to-Person	4	3C, S	67
Giardiasis	5	2C, 3DC	33
Scabies	5	4I, S	36
Salmonellosis			
Foodborne	1	C	6
Person-to-Person	1	C	37
Infuenza-like	1	S	1,050
Chickenpox	1	I	7
Fifth Disease	1	DC	6
Legionellosis			
Airborne	1	O	4
Meningococcal Disease	1	I	3
E. coli O157:H7	1	C	3
Vibrio damsela			
Foodborne	1	R	2
TOTAL	**40**		**1,627**

Key:
C Community
CA Camp
DC Day Care
I Prison or Other Correctional Institution
O Other
R Restaurant
S School

* Does not include outbreaks related to sexually transmitted diseases, tuberculosis, vaccine-preventable diseases and zoonotic diseases. These disease outbreaks are covered in other articles contained in this issue.

agents. Shigellosis was the causative agent in five (55.6%) of the outbreaks, which affected a total of 124 people. The mode of transmission in all but one outbreak was person-to-person. Settings included three day care centers and one school. The other outbreak was associated with an annual campout of homeless people who used untreated water from streams and creeks in a national park.

Salmonellosis was implicated as the cause in two (22.2%) of the nine enteric outbreaks, affecting a total of 43 people. Both outbreaks were in communities. Mode of transmission for one was foodborne; the second involved person-to-person transmission.

E. coli 0157:H7 was implicated as the cause of a person-to-person transmission of illness among three people in a community outbreak. The other enteric outbreak involved two foodborne cases of *Vibrio damsela* in a restaurant.

Hepatitis A was implicated in five outbreaks affecting a total of 71 people. In four of the outbreaks, transmission of the virus was person-to-person; transmission in the other was foodborne. The settings for these outbreaks were three communities, one school and one restaurant. Missouri experienced a large number of hepatitis A cases (1,414) in 1996. The majority of these cases were not associated with specific outbreaks, but reflected ongoing transmission of this infection in large areas of the state.

There were five outbreaks of giardiasis reported in 1996. These outbreaks affected 33 people, and the mode of transmission in each instance was person-to-person. Settings for the outbreaks included three day care centers and two community-wide events.

Scabies was the causative agent in five outbreaks affecting a total of 36 persons. Four of these outbreaks were in correctional institutions and one occurred in a school. Mode of transmission in each of these outbreaks was person-to-person.

Table 2. Nosocomial disease outbreaks by etiology and number of cases, Missouri, 1996.

Disease/ Mode of Transmission	No. of Outbreaks	No. of Cases
Scabies	15	207
Acute Respiratory Illness of Unknown Etiology	7	283
Acute Gastrointestinal Illness of Unknown Etiology		
Person-to-Person	6	171
Influenza	2	45
Influenza-like	1	56
Multiple Organisms (Associated) Surgical Procedure	1	10
Methicillin-resistant *Staphylococcus aureus*	1	8
Chickenpox	1	3
TOTAL	**34**	**783**

Chickenpox was the causative agent of an outbreak of illness in a correctional institution affecting seven people.

A bar was the setting for an outbreak of Legionellosis affecting four people. Mode of transmission was airborne, related to the aerosolization of sump water.

1996 Nosocomial Disease Outbreaks

Hospitals, nursing homes and other health-care facilities in Missouri reported 34 health care-associated (nosocomial) outbreaks of communicable disease in 1996. This compares with 33 nosocomial outbreaks reported in 1995. The 34 outbreaks reported in 1996 affected a total of 783 people. The 33 outbreaks reported in 1995 affected a total of 810 people.

Mode of transmission in all nosocomial outbreaks was person-to-person. Table 2 lists these outbreaks by etiology and number of cases.

Scabies accounted for 15 (44.1%) of the 34 outbreaks, affecting a total of 207 people.

Acute respiratory illness of unknown etiology accounted for outbreaks in seven facilities, affecting a total of 283 people.

Acute gastrointestinal illness of unknown etiology accounted for six of the outbreaks, affecting a total of 171 persons.

Two confirmed type A influenza outbreaks affecting 45 people, and an outbreak of influenza-like illness affecting 56 people, were reported.

Eight cases of methicillin-resistant *Staphylococcus aureus* were reported in an outbreak in one facility.

One facility outbreak involved three cases of chickenpox. An outbreak involving several organisms associated with a surgical procedure performed on ten individuals occurred at another facility.

Tick-Borne Disease Summary - 1996

F. T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

Rocky Mountain Spotted Fever

Rocky Mountain Spotted Fever (RMSF) is characterized by sudden onset of symptoms including headache, conjunctivitis, peripheral and periorbital edema, chills, fever lasting two to three weeks, myalgia and a maculopapular rash usually appearing on the second to sixth day. The rash is the most characteristic and helpful diagnostic sign. It usually appears first on the wrists and ankles and may include the palms and soles, spreading centripetally to the rest of the body. If treatment is delayed, petechiae and purpuric skin lesions are common. Health professionals are encouraged to investigate the possibility of tick exposure when diagnosing illnesses in patients presenting with these symptoms. The infectious agent of RMSF is *Rickettsia rickettsii*. Even though dogs, rodents and other small animals may harbor the rickettsiae, the principle vector and reservoir is the tick.

Ninety percent of the rickettsial diseases that occur annually in the United States are RMSF. During the 1980s, approximately 50 deaths per year were attributed to RMSF. An endemic focus for RMSF exists in Missouri, Arkansas, Oklahoma and Texas.

An analysis of Missouri's RMSF cases over the past 15 years (1982–96) continues to show a yearly average of 25 reported cases. The 19 cases reported in 1996 fall slightly below that average. The highest number of cases, 54, was reported in 1988. Since 1988, the number of cases reported per year has declined, probably due to the normal cycling of disease. Better diagnostic procedures are allowing for early diagnosis of cases, and antibiotic treatment is very effective. The severity of RMSF cannot be discounted, as five deaths in the past ten years in Missouri have been attributed to RMSF. Figure 1 shows the total number

Personal Protection Against Tick-Borne Diseases

- Avoid known tick-infested areas.
- Apply repellents such as diethyltoluamide (DEET) and dimethylphthalate to clothing and exposed parts of the body. (These repellents are active ingredients in many popular insect repellents. Read and follow label directions.)
- Wear clothing that interferes with tick attachment (boots, full length and one-piece outer garments).
- Avoid sitting on grass and logs where exposure to ticks increases.
- Every four to six hours, inspect entire body, including scalp, arm pits and groin, to detect and remove attached ticks.

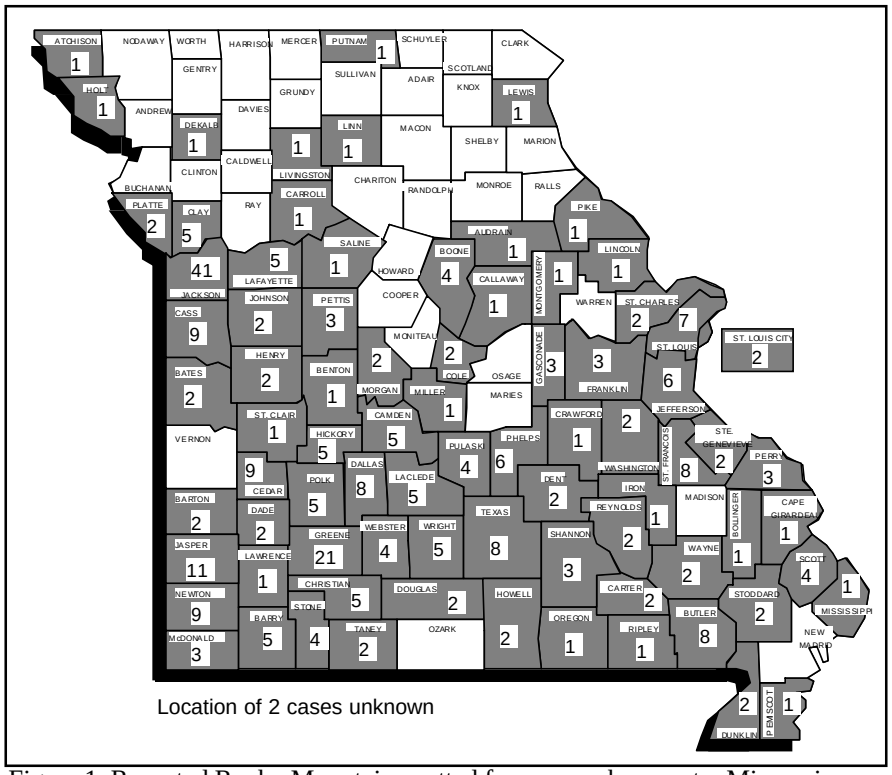

Figure 1. Reported Rocky Mountain spotted fever cases by county, Missouri, 1987–96.

of RMSF cases reported in Missouri by county from 1987–96.

Tularemia

Tularemia is a disease of man and animals caused by the bacteria *Francisella tularensis*. Tularemia is also called rabbit fever and deerfly fever. Tularemia is enzootic in animals throughout the continental United States and in most areas of the world between 30 to 71 degrees north latitude. Based on biogeographic epidemiology, Missouri lies in one of the two recognized tularemia regions in the North American continent. This region, called the Ozark Plateau, encompasses portions of Missouri, Arkansas, Oklahoma and Kansas.

This oldest tick-borne disease in Missouri has declined from an average of 35 cases per year over the past 15 years to a record low of only 9 cases reported in 1996. Missouri had 58 cases of tularemia reported in 1987, and the number of cases has declined yearly to its present low. A direct explanation of the low number of cases reported in 1996 is not possible as there are many factors that affect the organism, the vector and the host. Variation of all these factors produce cycles in disease incidence. At the present time, tularemia is at a low ebb.

Most tularemia cases in Missouri occur south of the Missouri River. Figure 2 shows the total number of cases reported in Missouri by county from 1987–96.

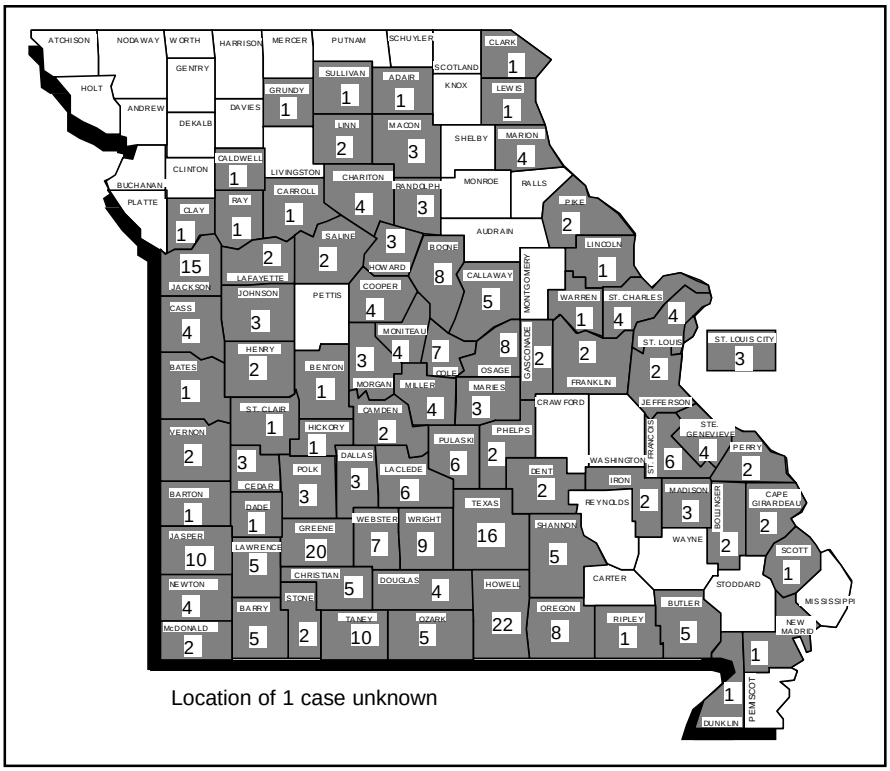

Figure 2. Reported tularemia cases by county, Missouri, 1987–96.

Ehrlichiosis

Ehrlichiosis is an acute febrile illness of humans caused by *Ehrlichia chaffeensis* and thought to be transmitted by the brown dog tick, *Rhipicephalus sanguineus*. As with other tick-borne diseases, it has an acute onset with flu-like symptoms including headache, myalgia, anorexia, nausea and, in some instances, a rash. Clinical laboratory abnormalities include leukopenia, thrombocytopenia and elevated levels of hepatic aminotransferase.

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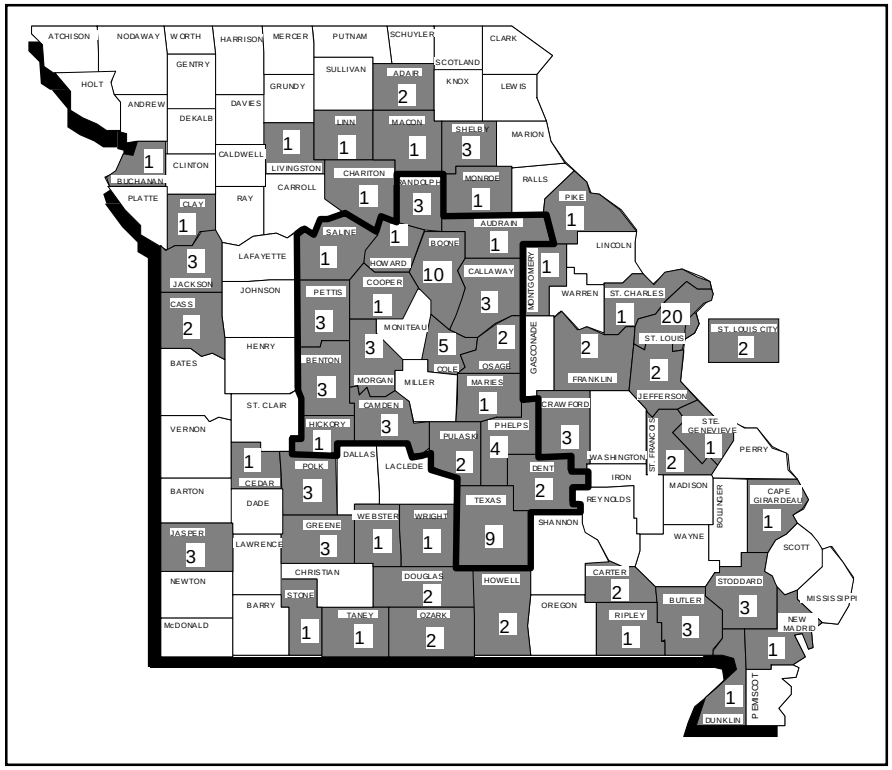

Figure 3. Reported ehrlichiosis cases by county, Missouri, 1988–96.

Environmental Prevention Against Tick-Borne Diseases

- Keep weeds and grass cut in yards and recreational areas.
- Clear brush along paths.
- Remove ticks from pets to minimize the tick population in areas near residences.

(continued from page 11)

A total of 142 human ehrlichiosis infections were reported in Missouri since 1988, or an average of 15 cases per year. Missouri continues to account for the majority of the ehrlichiosis cases reported nationally, with central Missouri being the epicenter of the state (outlined in Figure 3 on page 11). The 36 central counties accounted for over 54 cases reported from 1988–96. See Figure 3.

Figure 4 shows the distribution by county of the 32 ehrlichiosis cases reported in Missouri in 1996.

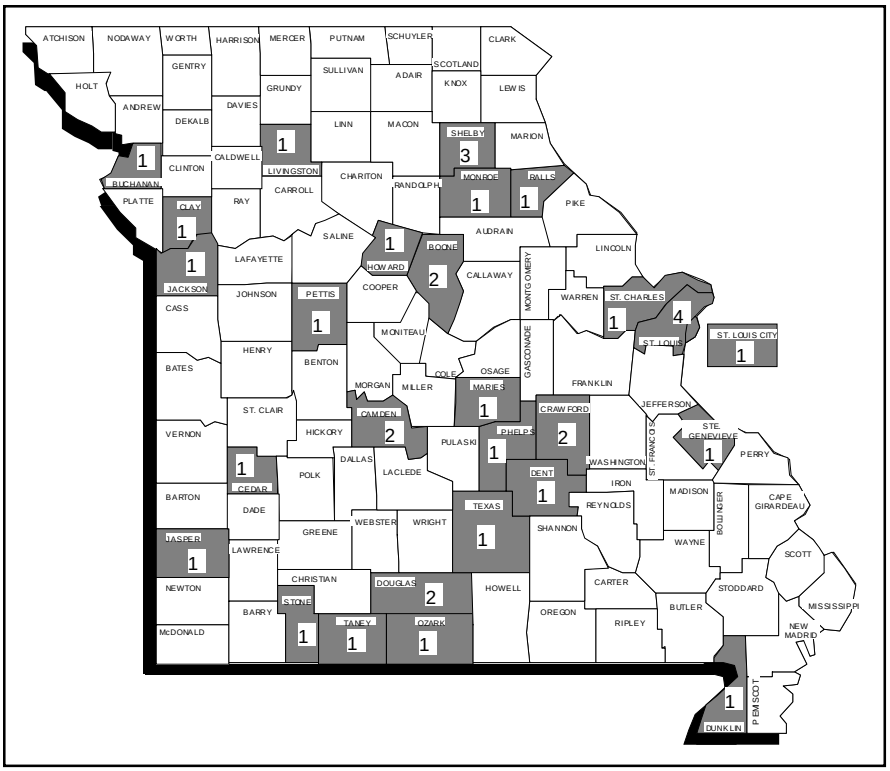

Figure 4. Reported ehrlichosis cases by county, Missouri, 1996.

Borreliosis

Borreliosis is a bacterial illness transmitted by ticks to wildlife and man. Borreliosis has become the most commonly reported vector-borne disease in the United States with as many as 90 percent of all cases being reported from the northeastern United States. The tick most commonly reported as the vector for Lyme disease is *Ixodes scapularis* (formerly *Ixodes dammini*). *I. scapularis* is not common in Missouri. Other possible vectors in Missouri include *Amblyomma americanum* (the Lone Star tick) and *Dermacenter variabilis* (the American dog tick).

There were 52 cases of borreliosis reported in Missouri in 1996 that met the case criteria set by the Centers for Disease Control and Prevention and the Council of State and Territorial Epidemiologists. Figure 5 shows the number of borreliosis cases reported in Missouri in 1996 by county.

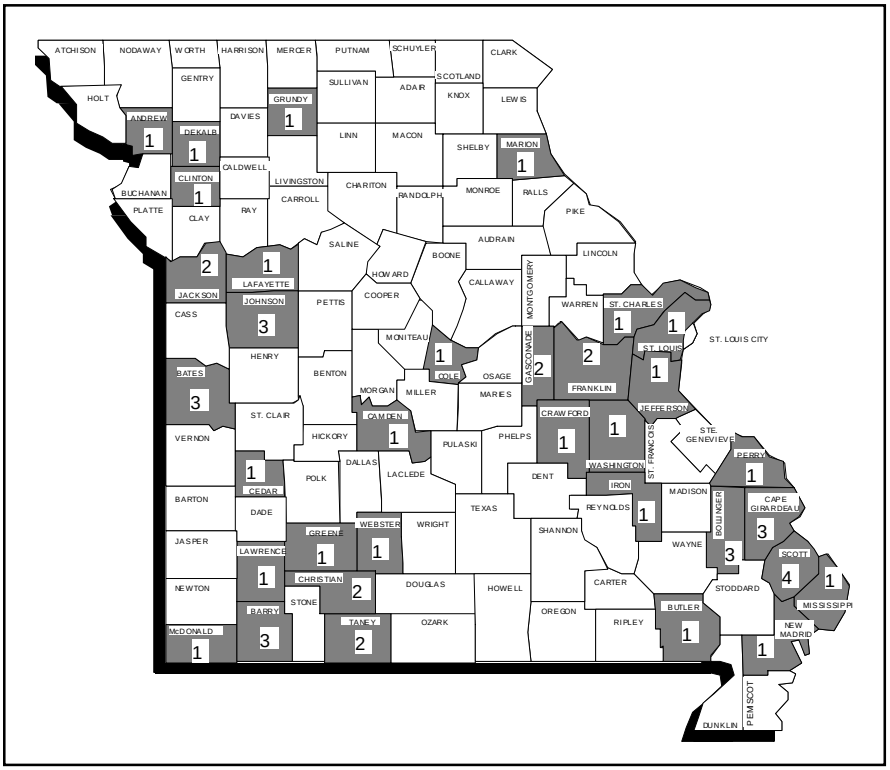

Figure 5. Reported borreliosis cases by county, Missouri, 1996.

Bureau of Environmental Epidemiology 1996 Annual Report

Brian M . Quinn
Bureau of Environmental Epidemiology

The Bureau of Environmental Epidemiology (BEE) is one of the Missouri Department of Health's most diverse units. From risk and health assessment to epidemiological studies, from occupational fatality investigation to childhood lead poisoning prevention, BEE serves Missourians through a wide variety of environmental health programs. Even though BEE is diverse, the bureau is singular in its purpose—to protect the health and well-being of all Missourians.

BEE Risk Assessment Programs

BEE's two risk assessment programs are heavily involved in assessing the risk that hazardous substances in the environment pose to human health. These programs work closely with other state and federal environmental and health agencies, including the U.S. Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (DNR), the federal Agency for Toxic Substances and Disease Registry (ATSDR), the Department of Defense (DOD) and the Department of Energy (DOE). These programs assess human risk through several different kinds of documents that discuss exposure levels, safe clean-up levels and various aspects related to exposure to hazardous substances found at hazardous waste sites statewide. An EPA-funded risk assessment involves a quantitative analysis or review of information about a hazardous waste site. This kind of assessment provides a mathematical "best guess" of what will happen if the site is not cleaned up or if the site is only cleaned up to a specific level of contamination, rather than a safe (walk away) level. A state-funded risk assessment provides more generic clean-up guidelines for sites, based on similar but not identical assumptions/formulae in contrast to EPA numbers. The information given in the following two subsections reflect research, cooperation, coordination, document review and interagency communication by BEE staff.

Risk Assessment Program (EPA)

- Completed three site-specific human health risk assessments.
- Completed one site-specific ecological risk assessment.
- Developed safe ambient air levels for one site.
- Developed safe residual soil levels for one site.
- Reviewed four risk assessments (from other agencies).
- Determined remedial goals for four sites.
- Attended five training courses.
- Gave one presentation to citizens and a citizens advisory committee.
- Maintained effective communication and working relationships with numerous local, state and federal agencies and organizations.

For more information, contact the program at (800) 392-7245.

Risk Assessment Program (State)

- Reassessed 53 abandoned or uncontrolled hazardous waste sites for their risk to public health.
- Analyzed 21 sites to determine if private drinking water wells were impacted by nearby contamination.
- Continued assisting DNR by reassessing the health risks at five DOD sites. One is an active Air Force base; the other sites are inactive, but are being cleaned up for future use.
- Provided health information to DNR to assist with its Voluntary Cleanup Program. Forty of these sites are already cleaned up, while 120 more properties are in the process of cleanup.
- Completed six clean-up assessments on sites other than abandoned or uncontrolled hazardous waste sites.
- Assisted DNR in developing a guidance document for their Brownfield Redevelopment Program.
- Provided consultative services to DNR's Air Pollution Control Program regarding acceptable ambient air levels at 25 sites.

For more information, contact the program at (800) 392-7245.

Public Health Assessment Program (ATSDR)

The Public Health Assessment Program is part of a state cooperative agreement with ATSDR to conduct health assessments in Missouri communities near hazardous waste sites. In contrast to EPA and state risk assessments, public health assessments provide a qualitative evaluation of exposures to contaminants at a site and related adverse health effects that could have occurred in the past, are presently occurring, or could occur in the future. These health effects are evaluated by estimating exposures based on interviews with citizens, community and elected leaders, etc., or based on review of documents such as risk assessments, site histories and any other available information about a site. Findings from these assessments are reported through different types of documents including public health assessments, site review and updates, health consultations and site summaries. These documents are designed to inform and educate the communities about sites, and help them make decisions about how to protect themselves from exposure to site-related contaminants and resulting adverse health effects. These documents also are used by environmental agencies with regulatory power (e.g., EPA) to help make the most health protective decisions when planning clean-up or remediation actions at a site.

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All of these program activities represent a tremendous amount of communication, coordination and cooperation with numerous local, state, and federal departments and agencies required to complete the work summarized in this report. This program has also been heavily involved in numerous other sites and issues which are currently in the early stages of community and government activity and development**.** In 1995, the Public Health Assessment program:

- Completed one public health assessment.
- Completed one health consultation.
- Completed one site review and update.
- Completed one summary document.
- Hosted or attended five public availability sessions.
- Visited 12 hazardous waste sites statewide.
- Coordinated two major multi-agency site enhancement projects.
- Coordinated or participated in two community surveys.
- Prepared four news releases regarding program/bureau activities.
- Participated in five Community Assistance Group meetings.
- Participated in numerous health education group meetings.
- Provided technical assistance to other agencies.

For more information, contact the program at (800) 392-7245.

Missouri Occupational Fatality Assessment and Control Evaluation (MO FACE) Program

This program operates through a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH). It is responsible for conducting in-depth epidemiological investigations of work-related fatalities including deaths resulting from falls, electrocutions, machinery-related incidents, confined-space incidents and other causes. Occupational Fatality Reports produced from these investigations are shared with NIOSH, the employer involved, and safety groups statewide. The MO FACE program works closely with employers involved in workplace fatalities to help them take steps to prevent similar incidents from happening again. The program is also developing intervention initiatives, such as workshops and seminars, to help employers recognize workplace hazards so they can prevent fatalities before they occur. In 1996, the MO FACE program:

- Completed 10 occupational fatality investigations:
  7 machine-related incidents
  2 falls
  1 electrocution
- Received notification of 319 possible workplace fatalities and determined that 138 were traumatic work-related fatalities**.**
- Created, coordinated and conducted two Fall Protection Workshops for the construction industry (one in Joplin and one in Springfield). Approximately 70 persons attended.
- Gave four presentations to representatives from local, state and federal agencies and to college classes.
- Maintained close working relationships with MO FACE surveillance system participants (114 county coroners, 114 sheriff's departments, 548 police departments, 804 fire departments and 221 ambulance services).

For a copy of the 1996 MO FACE Annual Report, contact the program at (800) 392-7245.

Childhood Lead Poisoning Prevention Program

Childhood lead poisoning is one of the most common preventable environmental health problems in the world today. Its adverse toxic health effects on young children's developing nervous, hematopoietic and renal systems range from acute (coma and seizures) to subtle (learning and behavioral problems or anemia). Children are at greater risk due to hand-to-mouth behaviors that allow ingestion of lead dust. Testing, treatment and prevention of access to lead hazards are key elements to finding and, ultimately, eliminating childhood lead poisoning.

Today, the most frequent cause of lead poisoning in children comes from deteriorating lead-based paint found primarily in older housing. While Missouri has its share of older homes containing lead-based paint, the state also features areas of contaminated soil in vicinities near lead mines and smelters due to its unique role as the largest producer of lead and lead products in the United States.

During 1996, 45,560 Missouri children, less than 6 years of age, were reported as being screened for lead poisoning. This reflects a two percent increase over the number of screenings performed during 1995. However, the number of children found with blood lead elevations ≥10mg/dl (the level at which a child is considered lead poisoned) decreased from 13.9 percent (6,219/44,694 screened) in 1995 to 8.3 percent (3,781/45,560 screened) in 1996.

These data reflect national trends, as reported by Phase 2 of the Centers for Disease Control and Prevention (CDC) National Health and Nutrition Examination Survey (NHANES) III, conducted from October 1991 to September 1994 and summarized in the February 21, 1997 issue of CDC's *Morbidity and Mortality Weekly Report*. At the same time, CDC released a draft of new screening guidelines which propose targeting screening outreach activities based on certain risk factors. These risk factors include the quantity of pre-1950 housing (due to a higher concentration of lead-based paint) and current screening data. Poverty indicators may also be incorporated into the data to assist in identifying areas where children are at increased potential for inhabiting older and deteriorating housing. In Missouri, other useful factors to include are whether parents are employed at lead mines or smelters and/or other lead occupations and hobbies.

According to the 1990 U.S. Census, 27 percent of the housing stock in Missouri was built prior to 1950. Figure 1 shows the percentage of pre-1950 housing by county in Missouri with an overlay of the percentage of children less than 6 years of age who are at or below 100 percent of the poverty level. These indicators identify many counties in Missouri that show a high potential risk of childhood lead poisoning. Smaller geographic boundaries (such as zip codes, census tracts, etc.) identify areas with higher potential risk for lead poisoning. Unfortunately, in many areas of Missouri, inadequate numbers of children are screened, preventing the comparison of risk to reality.

A major function of the Missouri Childhood Lead Poisoning Prevention Program is to increase the number of reported blood lead screenings in order to determine the extent of lead poisoning and its location. Efforts necessary to accomplish this include educating physicians regarding required blood lead screening during 12- and 24-month well-child visits, encouraging private laboratory reporting, and increasing general public awareness through various media sources Future efforts will continue to be more focused on areas identified to have the greatest potential risk to children based on housing, poverty, screening numbers and lead occupations.

Another primary role of the Missouri Childhood Lead Poisoning Prevention Program is to identify the source of lead hazard in the environment for a child with a confirmed elevated blood lead level, then to prevent or eliminate access to the hazard. Home environmental assessments are generally conducted by a public health nurse and sanitarian (trained in lead hazard assessment) who educate the family about specific personal hygiene, such as frequent and thorough handwashing of the child, washing toys, wet mopping to remove lead dust from floors and surfaces where small children play, and good nutrition through a diet high in iron and calcium to prevent bodily absorption of lead.

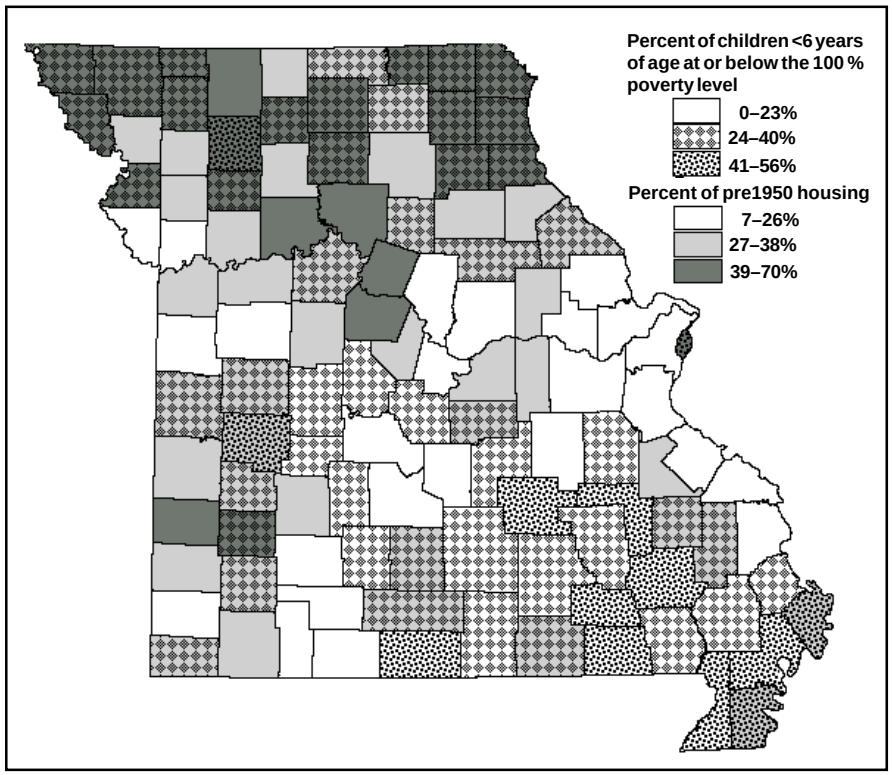

Figure 1. Percent of pre-1950 housing and percent of children <6 years of age at or below the 100 percent poverty level by county, Missouri, 1990.

During 1996, an environmental assessment to detect the source of the lead hazard was conducted for 70.2 percent of all children reported with elevated blood lead levels compared to 51.2 percent done in 1995.

Throughout the state, other lead program efforts include increasing community awareness and involvement in the efforts to eliminate and prevent childhood lead poisoning. Information concerning the level of risk for childhood lead poisoning for local needs assessments play an integral role in this process. For further information, please contact your local health department, or call the Childhood Lead Poisoning Prevention Program at (800) 575-9267.

Missouri Hazardous Substances Emergency Events Surveillance (HSEES) Program

The HSEES program is responsible for monitoring, collecting and interpreting information on emergency events involving the release of hazardous substances (spills, releases, accidents or threats of these). This information is analyzed to provide a clearer picture of how such events affect the health and well-being of Missourians. The results are then used to help protect the public from injury and death caused by exposure to hazardous substance releases.

During 1996, this program investigated 298 potential hazardous substances emergency events and identified 161 as meeting the case definition.

This program's complete annual report may be found on pages 30–32 of this issue. For more information, contact the program at (800) 392-7245.

Environmental and Occupational Diseases and Conditions Passive Surveillance System

The bureau maintains this passive surveillance system to document

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(continued from page 15)
occupational diseases and health conditions which are required to be reported to the Department of Health by 19 CSR 20-20.020 and 19 CSR 20-20.080. In 1996, the surveillance system received reports on 13,038 cases of environmental and occupational diseases and conditions. This number does not include cases of lead poisoning in children under 6 years of age, which are tracked by the bureau's childhood lead poisoning prevention program.

The majority of conditions reported in 1996 were lead poisoing in adults (11,385 reports), lead poisoning in 6 to 17-year-olds (1,504 reports), acute chemical poisoning (156 cases) and carbon monoxide poisoning (32 cases).

For more information, contact the program at (800) 392-7245.

Radiological Health Program

BEE's Radiological Health Program is responsible for overseeing and regulating sources of ionizing radiation in non-medical settings. These sources are used in many ways, for example in nuclear pharmacies and industrial radiography. The program is also involved in emergency response and environmental radiation activities. Program staff conduct radon surveys statewide and provide radon information through seminars, displays and public awareness presentations. The Radon Hotline provides Missouri residents easy access to radon information. In 1996, the Radiological Health Program:

- Continued to register and reregister ionizing radiation sources used in non-medical settings:
  - 86 industrial radioactive material users
  - 113 x-ray users
- Participated in extensive training activities in preparation for emergency events at the Callaway and Cooper county nuclear plants. Training included drills, dress rehearsals and exercises. This year's Cooper exercise was federally evaluated and the bureau successfully demonstrated the capability to protect public health and safety in the event of a nuclear plant emergency event.
- Participated for the seventh year in an EPA radon grant which provides funding for radon activities concentrated in counties that have a high potential for elevated radon levels. Activities included radon surveys in schools, daycare centers and numerous residences.
- Continued to maintain and cultivate close working relationships with local, state and federal departments and agencies including the American Lung Association, Missouri Association of School Administrators, Missouri Public Health Association and Missouri State Medical Association, as well as with other organizations.
- Presented 12 radon awareness programs at seminars, health fairs and other meetings.
- Provided radon detectors to 24 county and three city health departments for testing in their areas. Distributed more than 1,000 detectors to the public.
- Received approximately 512 phone calls through the Radon Hotline.

For more information, contact the Radon Hotline at (800) 669-7236.

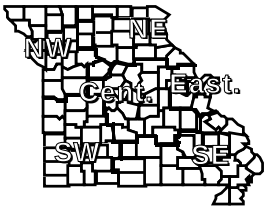
Special Studies

One of BEE's most important functions is to coordinate and conduct special epidemiological studies that are designed to determine whether and to what extent Missourians are exposed to hazardous substances in the environment. These studies require a tremendous amount of time, effort, coordination, planning, financial resources and personnel. A study can take up to two years or longer to complete from inception to the published final report. The following summarizes the bureau's special study efforts in 1996:

The bureau conducted a lead exposure study, funded by ATSDR, in children between the ages of 6 months to 6 years living in the area around the Big River Mine Tailings Site in St. Francois County. The study found that 17 percent of the participants in the study area had elevated blood lead levels, compared to three percent in the control area. Analysis of environmental samples and questionnaire data was completed in 1996. The final report was released to the public on May 27, 1997. If you have questions regarding this study or its availability, please call (800) 392-7245.

The bureau is also conducting a study to determine the exposure of area residents to emissions from the dioxin incinerator in Times Beach, Missouri. The first round of blood samples was collected in September 1995, before the incinerator began operation in March 1996. Blood samples were taken from 76 participants in the study area and 74 participants in a comparison area. The second sampling was performed in July 1996, approximately four months after the incinerator began operation. Second-round blood samples were taken from 75 of the original 76 participants in the study area and from 70 of the original 74 participants in the comparison area. The third and final sampling was conducted June 19–24, 1997.

Analysis of study results showed no increase in blood-dioxin levels between the first and second blood samples in the study population (persons living near the incinerator) or in the comparison population (persons living away from the incinerator). In fact, blood dioxin levels in both populations decreased between the first and second samples. The average tetrachlorodibenzo-p-dioxin (TCDD) concentration in study area participants was 1.81 parts per trillion (ppt) in the first sampling and 1.24 ppt in the second round. The average decrease for that group was .57 ppt. In comparison, the average TCDD in the participants from the comparison area for the first and second rounds were 1.43 and 1.38 ppt, respectively, an average decrease of .05 ppt.



Missouri Department of Health
Division of Environmental Health and Communicable Disease Prevention
QUARTERLY REPORT

Reporting Period *
January - March, 1997

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	3 MONTH STATE TOTALS		CUMULATIVE		5 YR MEDIAN
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1997	1996	FOR 1997	FOR 1996	
Vaccine Preventable Dis.																
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Hib Meningitis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	3
Hib Other Invasive	0	0	0	0	0	0		0	0	1	0	1	3	1	3	6
Influenza	7	13	9	9	8	8		6	20	105	9	194	132	194	132	163
Measles	0	1	0	0	0	1		0	0	0	0	2	1	2	1	0
Mumps	0	0	0	0	0	0		0	0	0	0	0	0	0	0	9
Pertussis	1	0	1	1	0	3		2	0	2	0	10	3	10	3	7
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0		0	0	0	0	0	1	0	1	0
Viral Hepatitis																
A	41	13	12	18	57	31		6	11	6	47	242	241	242	241	196
B	8	0	1	5	5	7		2	10	0	4	42	70	42	70	124
Non A - Non B	0	0	1	1	0	2		0	0	2	1	7	5	7	5	6
Unspecified	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Meningitis																
Meningococcal	2	0	4	4	4	1		1	7	6	0	29	24	29	24	11
Enteric Infections																
Campylobacter	11	2	15	12	9	8		0	1	13	4	75	64	75	64	86
Salmonella	9	2	11	6	6	7		2	8	9	3	63	106	63	106	86
Shigella	12	2	9	18	2	0		2	0	1	1	47	145	47	145	144
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Parasitic Infections																
Giardiasis	13	4	24	11	8	12		1	3	24	5	105	175	105	175	130
Sexually Transmitted Dis.																
AIDS	7	0	10	6	3	9	1	13	24	17	2	92	170	92	170	173
Gonorrhea	74	12	115	77	50	28		444	410	369	0	1579	2217	1579	2217	2929
Prim. & Sec. syphilis	0	1	0	3	1	0		1	13	3	0	22	93	22	93	194
Tuberculosis																
Extrapulmonary	0	0	0	1	0	0	0	1	2	2	0	6	4	6	4	6
Pulmonary	3	0	1	3	1	2	0	6	8	5	2	31	29	31	29	31
Zoonotic																
Psittacosis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rabies (Animal)	0	0	0	6	0	0		0	0	0	0	6	8	6	8	4
Rocky Mtn. Sp. Fever	0	0	0	0	1	0		0	0	0	0	1	0	1	0	0
Tularemia	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1

TEAR OUT FOR FUTURE REFERENCE

Low Frequency Diseases

Anthrax
Botulism
Brucellosis - 1
Chancroid
Cholera
Cryptosporidiosis - 5
Encephalitis (infectious) - 1
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionellosis - 4
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 1
Trichinosis

Outbreaks

Foodborne - 2
Nosocomial - 2
Pediculosis - 1
Scabies - 1
Other
- Acute Respiratory - 1
- Campylobacter - 1
- Chickenpox - 1
- Fifth Disease - 1
- Flu-like - 1
- Influenza - 1
- Rotavirus - 1
- Shigella - 1

*Reporting Period Beginning December 29, 1996, Ending March 29, 1997.
**Totals do not include KC, SLC, SLCo, or Springfield
***State and Federal Institutions

Due to data editing, totals may change.

State Public Health Laboratory - 1996 Annual Report

Metabolic Disease Screening

Infants screened	**77,120**
Presumptive positives:	
PKU	13
Hypothyroidism	978
Galactosemia	12
Sickle Cell	39
Other hemoglobinopathies	1,415

Serology/Virology

HIV Serology	**88,835**
HIV antibody positive	753
Syphilis Serology	**23,739**
Sero-confirmed reactive	1,296
Hepatitis A Serology	**1,705**
Positive	334
Hepatitis B Serology	**6,981**
Positive	118
Measles, Mumps and Rubella (Diagnostic Serologies)	**8,643**
Measles (IgM positive)	3
Mumps (significant rise in titer)	1
Rubella (IgM positive)	0
Prenatal rubella screens	8,595
Nonreactive patients	832
Viral Isolation	**952**
Influenza isolates	83
Enterovirus isolates	11
Herpes isolates	432
Rabies	**2,171**
Positive specimens	26

Microbiology

Enterics	**1,961**
Salmonella	758
Shigella	281
Campylobacter jejuni	32
E. coli O157:H7	63
Parasitology	**2,832**
Ova/parasites found	604
Reference Bacteriology	**1,241**
Francisella tularensis	4
Haemophilus influenzae	13
Neisseria meningitidis	76
Bordetella pertussis	75
DNA Probe for Chlamydia/Gonorrhea	**108,200**
N. gonorrhoeae	1,478
Chlamydia trachomatis	4,920

Environmental Testing

Chemistry	**17,896**
Blood lead samples	11,418
Total analyses	31,872
Blood lead $\geq$20 µg/dL	221
Environmental lead samples	241
Bacteriology—Water	
Private Samples	**11,174**
Coliform positive	2,840
Public Supplies	**61,961**
Coliform positive	2,382
E. coli/fecal coliform positive	311
Swimming Pools	**1,795**
Food/Dairy/Beverage	**3,470**
Excessive bacteria, coliform, yeast and mold	82

Tuberculosis Annual Report for 1996

Vic Tomlinson
Bureau of Tuberculosis Control

The number of tuberculosis cases nationwide continued to decrease in 1996. Reports from the Centers for Disease Control and Prevention (CDC) showed a decrease of 6.7 percent in the number of new tuberculosis cases reported nationwide. The number of cases decreased from 22,860 in 1995 to 21,327 in 1996. The case rate decreased from 8.7 per 100,000 population in 1995 to 8.0 in 1996. This represents the fourth consecutive year that tuberculosis cases have decreased nationally.

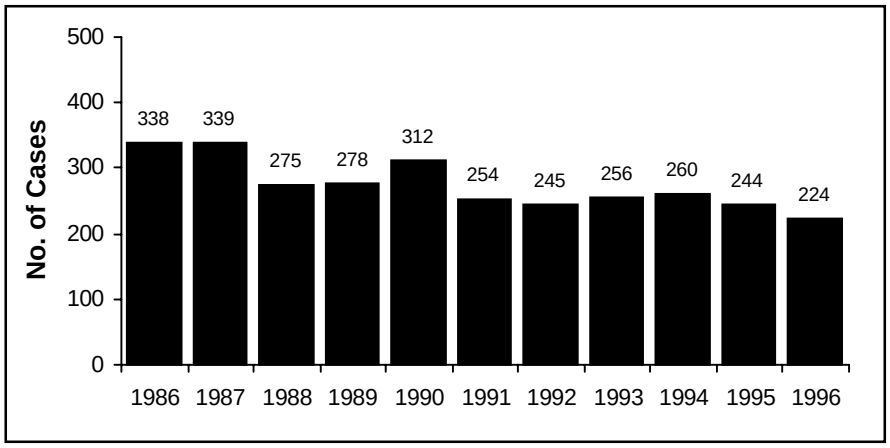


Figure 1. Reported tuberculosis cases by year, Missouri, 1986–96.

Cases of tuberculosis in Missouri also decreased, reaching an all time low of 224 cases in 1996, a case rate of 4.2 per 100,000 population. This represents a decrease of 8.2 percent from the 244 cases reported in 1995. See Figure 1.

The major metropolitan areas accounted for 63 percent of the reported cases in 1996, while the rural or outstate areas accounted for 37 percent. This is a shift compared with 1995, when the major metropolitan areas accounted for 52 percent and 48 percent were reported from the rural or outstate areas. While the total number of reported cases decreased, three of four major metropolitan areas experienced increases in the number of reported cases. St. Louis City increased from 40 to 44 reported cases, Springfield-Greene County increased from 10 to 17 cases and Kansas City increased from 42 to 48 cases. St. Louis City and Kansas City had the highest number of tuberculosis cases of any geographic area of the state, a case rate of 12.3 and 10.8 per 100,000 population, respectively. Springfield-Greene County had a case rate of 11.4 per 100,000. These rates are more than twice the state case rate of 4.2 and higher than the national case rate of 8.0. St. Louis County had a decrease in reported cases from 35 in 1995 to 32 in 1996. See Figure 2.

The outstate area showed a 29.1 percent decrease in the number of cases from 117 reported in 1995 to 83 in 1996. Increases were noted in two of the six

(continued on page 20)

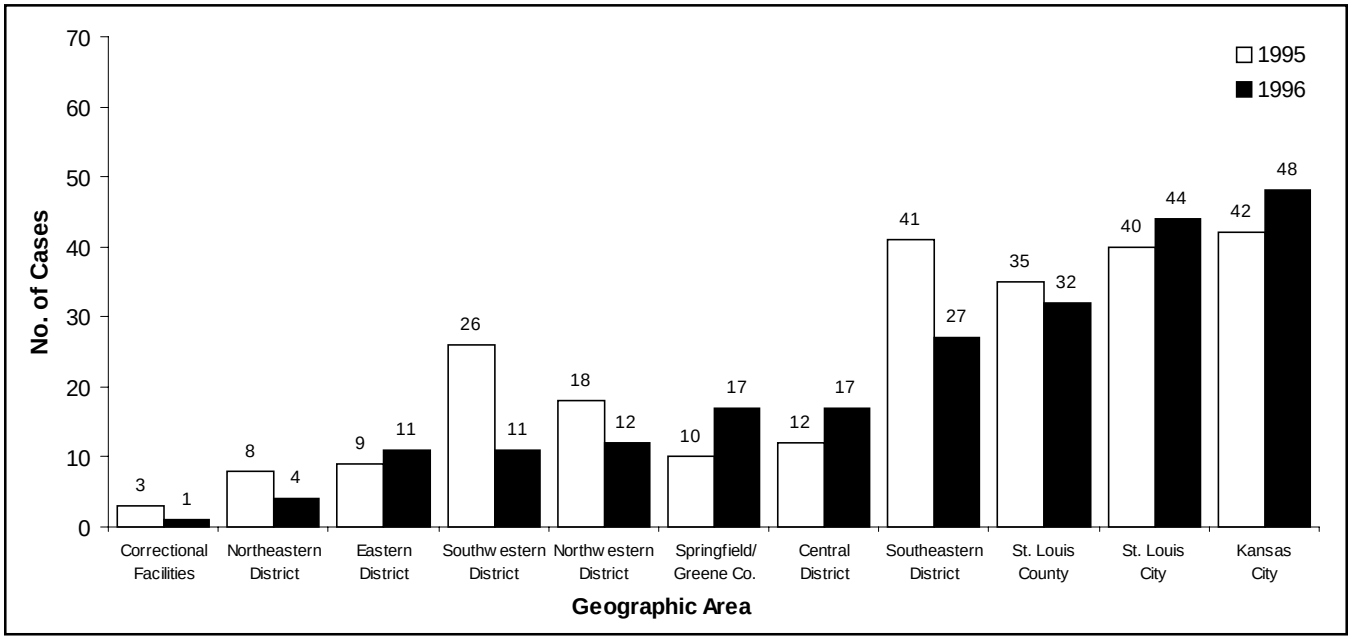


Figure 2. Reported tuberculosis cases by geographic area, Missouri, 1995 and 1996.

(continued from page 19)
health districts. The Central District increased from 12 to 17 reported cases and the Eastern District increased from 9 to 11 cases. The other health districts experienced decreases with the biggest occurring in the Southwestern District, which decreased 57.7 percent from 26 cases in 1995 to 11 cases in 1996. A decrease was also observed in the state and federal correctional facilities. See Figure 2.

Cases of tuberculosis among males continued to outnumber females. In 1996, 64.7 percent (145) of the cases were male and 35.3 percent (79) were female. In 1995, 61.9 percent (151) were male and 38.1 percent (93) were female.

In 1996, individuals with active disease ranged in age from less than 1 to 95. Increases were observed in the 15–24 age group (from 8 cases in 1995 to 12 cases in 1996) and the 25–44 age group (from 67 cases in 1995 to 69 cases in 1996). All other age groups showed a decrease. Tuberculosis cases for those under age 5 decreased from 4 in 1995 to 3 in 1996. This represents the third consecutive year that early childhood cases have decreased. The largest decrease was among those age 65 and over, from 107 cases (43.9%) in 1995 to 86 cases (38.4%) in 1996. See Figure 3.

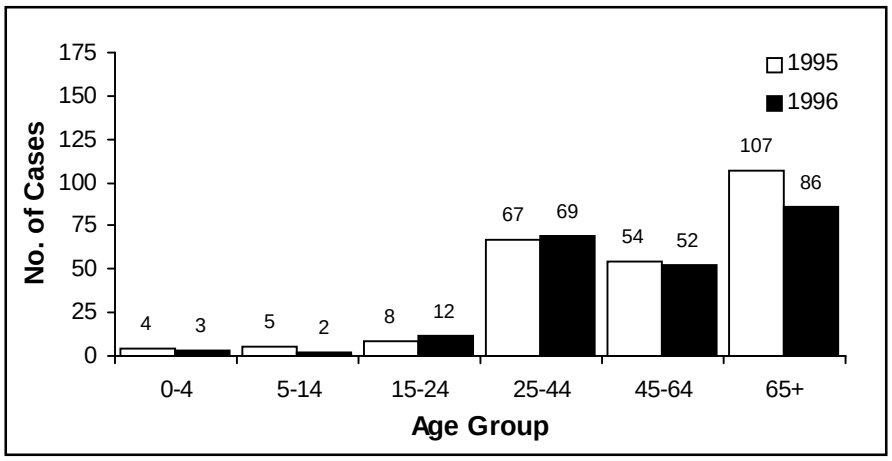


Figure 3. Reported tuberculosis cases by age, Missouri, 1995 and 1996.

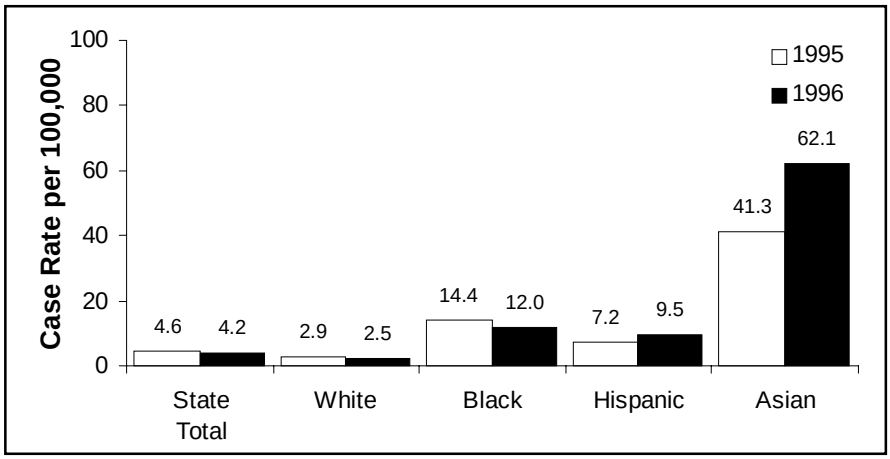


Figure 4. Tuberculosis case rates per 100,000 population by race and ethnicity, Missouri, 1995 and 1996.

Tuberculosis case rates vary significantly among racial and ethnic groups. In 1996, non-Hispanic whites accounted for 116 cases (51.8%), non-Hispanic blacks 70 (31.3%), Asians 30 (13.4%) and Hispanics 8 (3.6%). Asians had the highest case rate in 1996 at 62.1 compared to blacks at 12.0, Hispanics at 9.5 and whites with the lowest case rate of 2.5. From 1995 to 1996, rates increased among Asians and Hispanics. However, declining rates were noted among blacks and whites. See Figure 4.

The largest proportion of active disease cases were pulmonary with 182 (81.3%) as compared with 42 extrapulmonary (18.8%). There were 9 cases with dual disease sites. The types of extrapulmonary disease were lymphatic (12), pleural (9), bone (8), genitourinary (3), meningeal (2), miliary (1) and other (7). See Figure 5.

In 1996, drug susceptibility studies were performed on 186 (83.0%) of the 224 new tuberculosis cases reported. Three multiple drug resistant cases were reported during 1996. In addition, the single drug resistance rate remained high at 8.5 percent. When the rate exceeds four percent, initial use of four tuberculosis drugs is recommended for all suspects and active disease patients.

A pilot computerized data-matching project was initiated in June 1996 to determine dual diagnoses of tuberculosis and HIV/AIDS. Tuberculosis cases reported from January 1993 through December 1995 were matched to the entire set of HIV/AIDS cases reported in the HIV/AIDS Reporting System (HARS) database. As a result of this project, the STD/HIV and tuberculosis control bureaus now have a more efficient tool to collect information regarding dual diagnoses and completeness of reporting. Forty-nine cases were identified with dual diagnoses. Of the 49 cases, 37 were previously reported with tuberculosis in the HARS database and therefore the

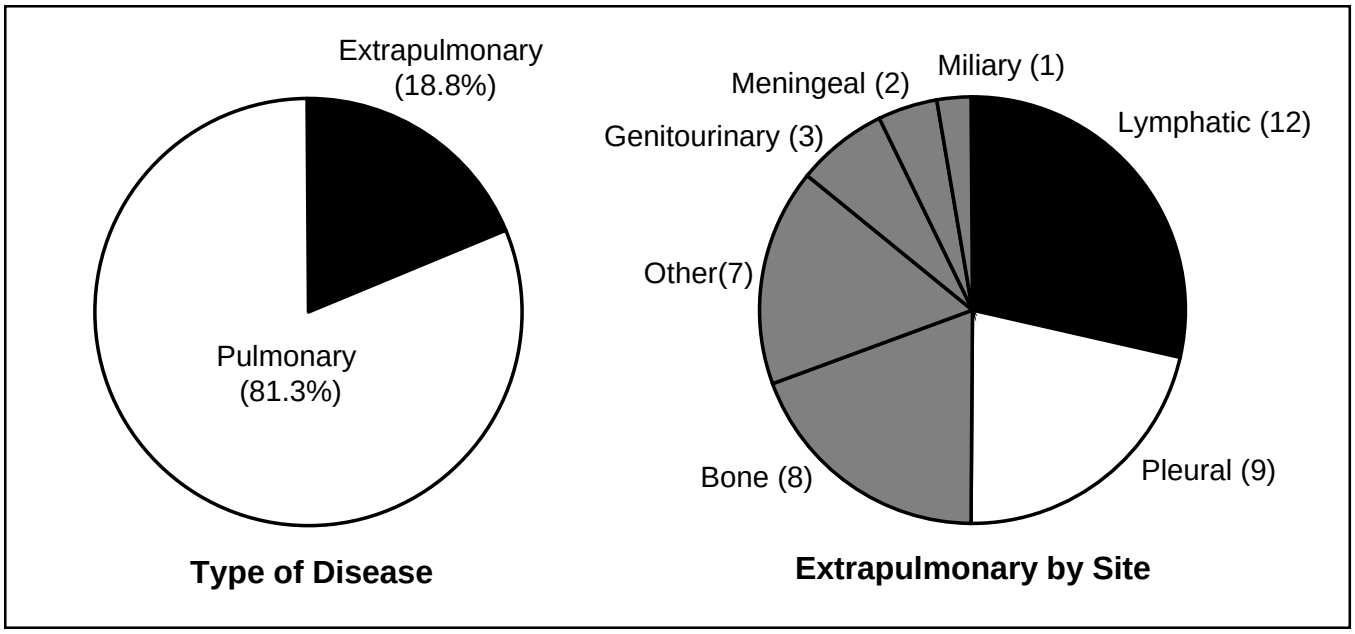


Figure 5. Reported tuberculosis cases by type of disease and site, Missouri, 1996.

completeness of reporting rate was 75 percent. Forty-one (84%) of the 49 cases were between the ages of 25–44. The remaining eight (16%) cases were age 45 or older. For the future, the computerized matching of databases will continue on a quarterly basis.

In 1996, only one active disease case was reported in the state correctional system as compared to three cases in 1995. The tuberculosis case rate in 1996 among state correctional inmates was 4.7 per 100,000 population. This is half the national rate of 8.0 and close to the state rate of 4.2. During 1996, a total of 24,560 inmates were screened. Of those, 555 (2.3%) were identified as new positives and 3,378 (13.8) had a history of previously positive skin tests. In 1996, a total of 7,736 employees in the state correctional system were tested. Of those tested, 73 (0.9%) were identified as new positives and 814 (10.5%) had a history of previously positive skin tests.

The number of tuberculosis cases reported in nursing homes and long-term care facilities is of concern to the Bureau of Tuberculosis Control. These facilities accounted for 13 (5.8%) of the reported cases in 1996. The bureau is addressing this issue by working closely with nursing home associations, residential care associations and the Division of Aging to provide facilities with the recommendations for tuberculin testing and follow-up of residents and employees.

The number of tuberculosis cases occurring among foreign-born persons increased from 27 (11%) in 1995 to 40 (18%) in 1996. However, case rates among foreign-born Asians are disproportionately higher than for other racial and ethnic groups. Asians accounted for 30 (13.4%) of all reported cases with a case rate of 62.1 per 100,000 population in 1996. This is substantially higher than the Asian case rate of 41.3 per 100,000 in 1995.

Directly observed therapy (DOT) has been adopted as the standard of care in Missouri. Our emphasis is on putting all active disease patients on DOT to ensure that therapy is completed. This strategy involves watching people swallow their pills. Our first priority is to motivate people to come to the local health departments for DOT. However, if this does not occur, then we must go to them. Volunteers will be recruited to assist the local health departments in conducting DOT and directly observed preventive therapy (DOPT). In 1995, 58.4 percent of the active disease patients were on DOT and this improved to 74.1 percent in 1996. However, much work remains to be done to reach 100 percent.

The initial use of four tuberculosis drugs is another priority for this program, in order to lower the single drug resistance rate. All suspects and active disease patients should be started on four drugs from the beginning of treatment until drug susceptibility is determined. Those drugs include isoniazid, rifampin, pyrazinamide and ethambutol or streptomycin. In 1995, only 50 percent of active disease patients were placed on the four-drug regimen. In 1996, this improved somewhat to 65 percent. However, much work remains in order to reach 100 percent.

If the downward trend in tuberculosis morbidity continues over the next few years, Missouri will attain its interim goal of no more than 175 new tuberculosis cases by the year 2000 and will be well on its way to the goal of tuberculosis elimination by the year 2010.

Sexually Transmitted Diseases and HIV - 1996

Beth Meyerson, M.Div
Kurt M. Kleier
Bureau of STD/HIV Prevention

Robert H. Hamm, M.D., M.P.H.
Office of Epidemiology

1996 Highlights

- ✔ 62% decrease in P&S Syphilis
- ✔ 74% decrease in Congenital Syphilis
- ✔ 25.5% decrease in Gonorrhea
- ✔ Institute of Medicine Report
- ✔ Reductions in AIDS Deaths

1996 was a tremendous year for the reduction of sexually transmitted disease. Missouri continued to effect reductions in gonorrhea and syphilis through strong prevention efforts in partnership with local health departments, clinicians, and community-based organizations that provide health education/risk reduction services to epidemiologically targeted populations. There was a national decline in AIDS deaths due in part to prevention efforts and to patient success with combination therapies. New sampling technologies for HIV such as oral sampling, home collection and rapid testing have entered the public health arena and can be utilized in innovative ways to increase individual awareness of serostatus. However, concomitant with these successes were continued increases in HIV and chlamydial infections. Missouri youth are at an ever increasing risk for sexually transmitted disease, and minority populations are disproportionately impacted by HIV and other sexually transmitted infections. Continued targeted and aggressive public health activity is necessary to halt sexually transmitted disease epidemics so that Missourians will achieve our fullest health potential in the face of emerging pathogens.

Early Syphilis: Primary and Secondary (P&S) and Early Latent (less than one year's duration)

During 1996, a total of 480 early syphilis cases were reported in Missouri residents. This represents a 56 percent decline from the 1,090 cases reported in 1995. Of the 480 reported cases of early syphilis, 46 percent (221 cases) were in the primary or secondary stage and 53.9 percent (259 cases) were in the early latent stage. These figures represent a 62.2 percent decline in P&S syphilis cases, and a 48.8 percent decline in early latent syphilis cases, from the 584 P&S cases and the 506 early latent cases reported in 1995. See Figure 1 for the P&S trends.

Notable declines in the number of P&S syphilis cases reported were seen in all areas of the state. St. Louis City reported 278 cases of early syphilis in 1996 (57.9% of Missouri cases), for a rate of 35.8 per 100,000 population. This is a 57.2 percent decrease from the 650 cases reported from St. Louis in 1995. St. Louis County reported 123 early syphilis cases in 1996 (25.6% of the state total), which represents a 58.9 percent decrease from the 299 cases reported in 1995. Kansas City reported 20 cases of early syphilis in 1996 (4.2% of Missouri cases), a 62.2 percent decrease from the 53 cases reported in 1995. Outstate Missouri

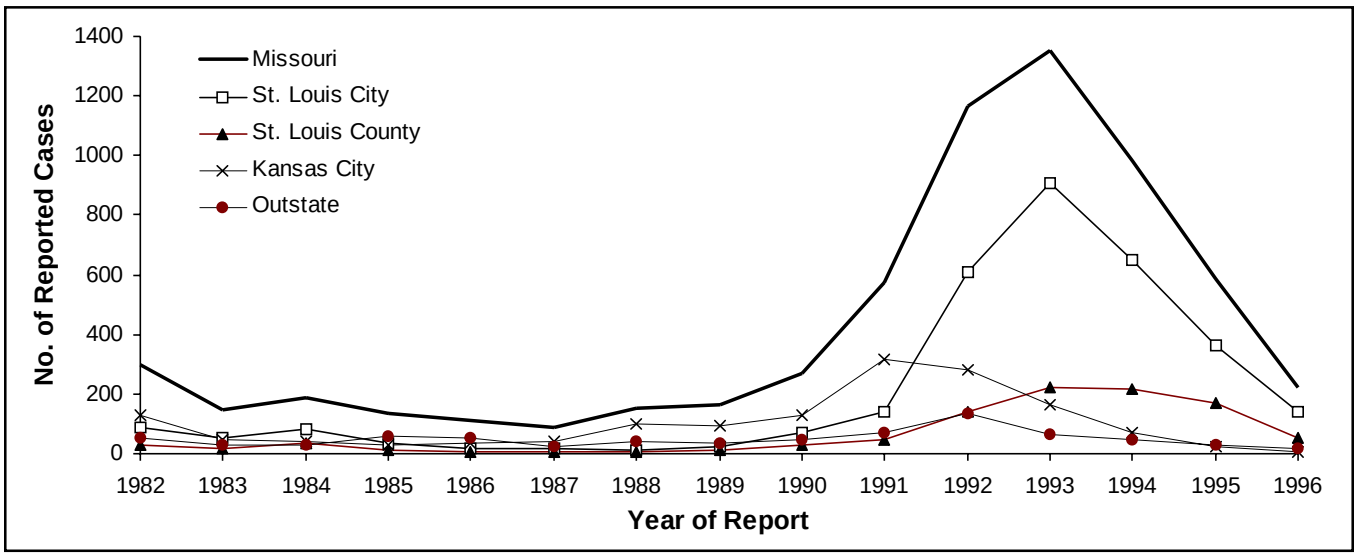


Figure 1. Reported primary and secondary syphilis cases by geographic area and year of report, Missouri, 1982–96.

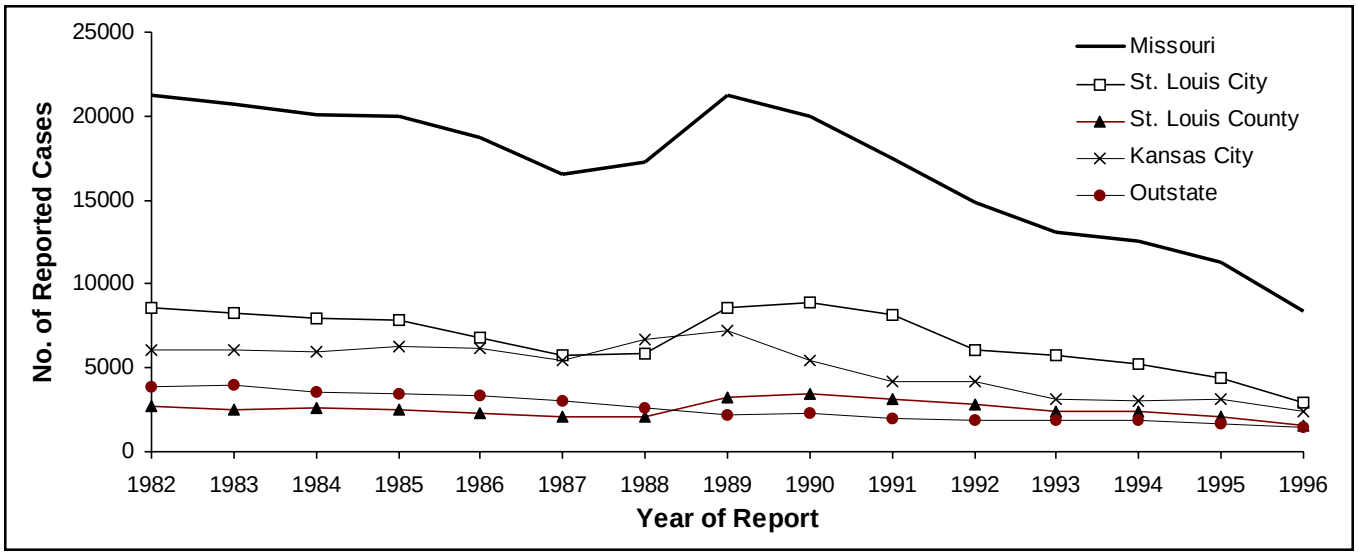


Figure 2. Reported gonorrhea cases by geographic area and year of report, Missouri, 1982–96.

reported 59 early syphilis cases in 1996 (12.3% of the state's total), a 44.3 percent decrease from the 88 cases reported in 1995.

During 1995,* 584 cases of P&S syphilis were reported in Missouri, which was 3.5 percent of the 16,500 cases nationwide. The rate of P&S syphilis cases in Missouri in 1995 was 11.4 per 100,000 population. This rate was 1.8 times greater than the United States rate of 6.3 per 100,000 population.

Although a significant decline in reported cases of early syphilis occurred during 1996, certain populations continue to be disproportionately represented among reported cases. African Americans comprise 92.3 percent of all reported P&S syphilis cases, whereas whites accounted for only 5.9 percent. The disproportionate impact of sexually transmitted diseases among African American and Latino Missourians remains a concern. The Department of Health is working actively with the Missouri HIV/STD Prevention Community Planning Group and regional groups to target prevention messages and interventions to the African American and Latino populations. Exchange of sex for drugs (primarily crack cocaine) or money, and low socioeconomic status, continue to be factors influencing disease incidence. Intensified public health field work and community outreach efforts are strongly contributing to declining early syphilis morbidity, as evidenced by the fact that, since 1992, Missouri has seen an 81.1 percent decrease in reported cases.

* 1995 is the most recent year for which U.S. data are available.

Congenital Syphilis

Reported cases of congenital syphilis continue to decrease. A total of 12 cases were reported in Missouri during 1996, representing a 73.9 percent decline from the 46 cases reported in 1995. St. Louis City reported the largest number of congenital syphilis cases (7, or 58.3% of total Missouri cases), followed by St. Louis County (4 cases 33.3% of the state total). A single case was reported from Outstate Missouri (8.3% of total reported cases). African American infants are disproportionately represented among congenital syphilis cases, comprising 10 (83.3%) of the 12 cases reported in 1996.

The continuing decline in reported congenital syphilis cases since 1993 can be attributed to successful intervention efforts in higher incidence areas which include routine screening of pregnant women, as well as enhanced prevention efforts with their male partners. These components are crucial to maintaining the number of congenital syphilis cases at a low level.

Gonorrhea

In 1996, reported cases of gonorrhea in Missouri decreased by 25.5 percent, from 11,299 cases in 1995 to 8,414 cases in 1996. This represents the eighth consecutive year that reported cases have declined statewide. St. Louis City reported 34.3 percent (2,884 cases) of all Missouri gonorrhea cases; Kansas City 28.5 percent (2,400 cases); St. Louis County 19.2 percent (1,614 cases), and Outstate Missouri 18.0 percent (1,516 cases). Each of these regions showed decreases in reported cases from 1995 to 1996: St. Louis City, -34.7 percent; Kansas City, -24.4 percent; St. Louis County, -21.7 percent; and Outstate Missouri, -8.0 percent. See Figure 2.

Two population groups are disproportionately represented among reported gonorrhea cases: African Americans and youth. African Americans made up 6,242 (74.4%) of the 8,414 reported cases in Missouri in 1996; the corresponding rate was 1,142 per 100,000 population. Whites contributed 850 (10.1%) reported cases, for a rate of 18.9 per 100,000 population. Youth between the ages of 13-19 made up 34.7 percent of total reported gonorrhea cases in 1996.

Missouri's declining numbers of reported gonorrhea cases parallel an overall

(continued on page 24)

(continued from page 23)
national trend that has been occurring in recent years. However, during this time Missouri's gonorrhea rate has been consistently higher than the national average. In 1995, the rate of gonorrhea cases per 100,000 population in Missouri (220.8) was 2.5 times the national rate (149.5).

Eighteen penicillinase-producing *Neisseria gonorrhoeae* (PPNG) cases were reported in Missouri during 1996.*

Chlamydia

Reported cases of *Chlamydia trachomatis* infections in Missouri decreased 1.0 percent from 12,052 cases in 1995 to 11,935 cases in 1996. Small declines were seen in all areas of the state except Kansas City, where there was a 58.8 percent increase in reported cases from 1995 to 1996 due to a reporting anomaly from a major reporting site. The anomaly accounted for approximately 1,000 cases which should have been included in the 1995 morbidity totals.

An increase in reported cases of chlamydia infection is expected in 1997 due to focused efforts of the Missouri Infertility Prevention Project (MIPP) to screen high risk women of childbearing age for both chlamydia infection and gonorrhea. Infertility prevention programs were implemented in several states and territories as a result of a pilot program initiated in 1988 in the Pacific Northwest (U.S. Public Health Service Region X) for large-scale screening for *C. trachomatis*, involving interdisciplinary cooperation and low-cost testing in centralized laboratories. The program raised the level of cooperation and collaboration between STD and family planning programs. As a result of the screening, subsequent effective treatment and other factors, the prevalence of chlamydia infections among women receiving reproductive health care services at family planning clinics was reduced by 58 percent.** In 1996, the MIPP screened 108,205 individuals for *C. trachomatis* infection, and reported an overall positivity rate of 4.5 percent, down 0.2 percent from the rate of 4.7 percent in 1995.

Youth, and particularly females between the ages of 13 and 24, are disproportionately represented among reported cases of chlamydia infection. Of total cases reported in 1996, 88.5 percent were in females, and of these females, over 75 percent were less than 25 years of age. See Figure 3. The disproportionate representation of females reflects their selective screening through the MIPP. If similar widespread screening of males were also undertaken, it is expected that the number of diagnosed and reported cases in males would be much higher than is currently seen.

Youth At Risk

In the United States this year, 12 million persons will be infected with a sexually transmitted disease. Three million of these persons will be teenagers.*** Missouri youth are clearly at risk for acquiring HIV infection, chlamydia infection, gonorrhea, and other sexually transmitted diseases. In Missouri during 1996, AIDS was the third leading cause of death in males 25–34 years of age, and the second leading cause of death in African American males in this age group. Among African American females 25–34 years of age, AIDS was the fifth leading cause of death. Many persons diagnosed with severe HIV disease (AIDS) while in their twenties may have been infected as teenagers. The highest risk group for chlamydia infections in Missouri is 14–19 year old females, reflecting a trend that is seen nationwide.

*Specific follow-up to differentiate PPNG from other strains of gonorrhea is not actively pursued because adequate treatment of PPNG is achieved by the current recommended treatment regimen.

** National Coalition of STD Directors, *Proposed Equitable Adjustments to the Current Distribution of Regional Infertility Prevention Project Funding to the STD Project Areas*, 1997.

*** Institute of Medicine, *The Hidden Epidemic: Confronting Sexually Transmitted Diseases*, (Washington, D.C.: National Academy Press, 1997).

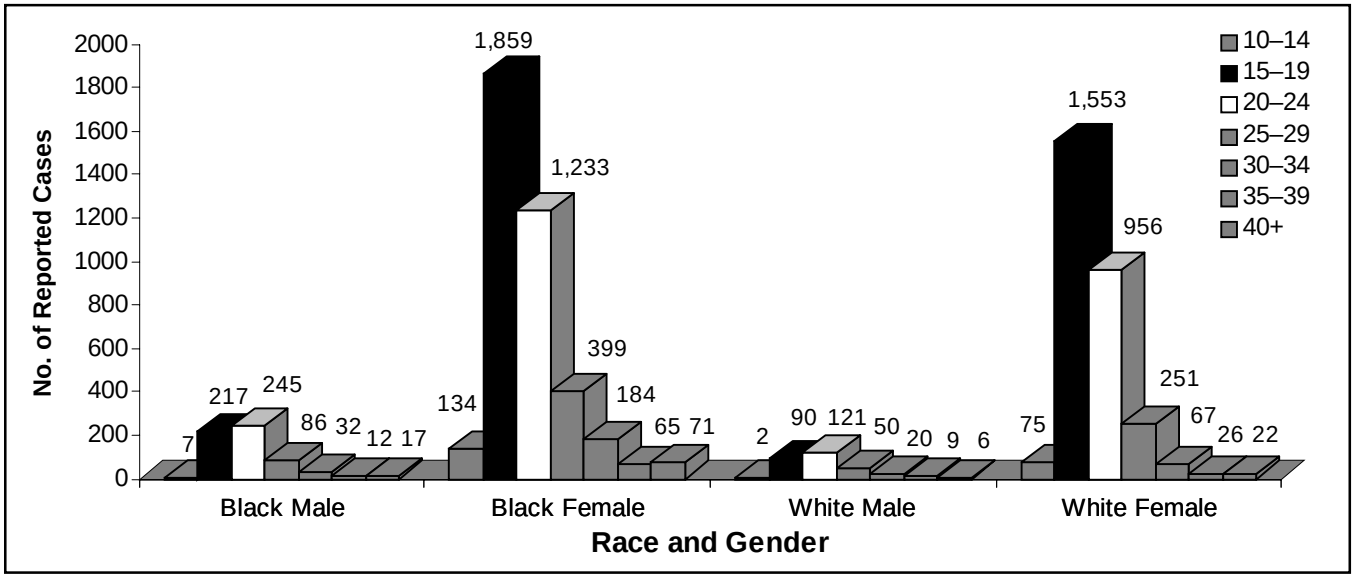


Figure 3. Reported chlamydia cases by race and gender, Missouri, 1996.

In a 1995¶ survey of 26 rural and urban Missouri school districts conducted by the Missouri Department of Elementary and Secondary Education, 9–12th graders indicated the following:

- 54% of high school students have had sexual intercourse
- 12% of 9th graders reported being sexually active before age 13
- 15% of 9th graders reported having sex with four or more partners, compared with 27% of 12th graders
- 60% of 9th graders reported using a condom during the last sexual intercourse, compared with 48% of 12th graders.

¶1995 is the most recent year for which data are available.

In February 1997, a National Institutes of Health Consensus Panel* strongly endorsed the use of behavioral intervention programs including syringe exchange, drug abuse treatment and youth education on safer sex as necessary actions to reduce the infection and transmission of HIV. The panel based its recommendations on scientific evidence which appeared to clearly demonstrate the effectiveness of such interventions.**

HIV Disease

Through the end of 1996, a total of 10,722 cases of HIV disease had been reported in Missouri residents; 4,228 (39.4%) of these individuals are known to have died. During 1996, 1,381 cases of HIV disease were reported.

HIV disease can be categorized as either 1) HIV cases or 2) severe HIV disease. Persons with **severe HIV disease** are those who have met the Centers for Disease Control and Prevention (CDC) surveillance case definition for AIDS (as the result of a CD4+ lymphocyte count <200/µL or the occurrence of a specific opportunistic disease), reflecting the presence of significant immune system damage and the fact that they are in a later stage of the disease process. For the purposes of this report, the term **severe HIV disease** is synonymous with AIDS. **HIV cases** refer to persons with HIV infection whose disease is at an earlier stage and who have not developed severe immune system damage. Thus, HIV cases in general represent persons more recently infected with HIV in comparison to cases of severe HIV disease.

Of the 10,722 reported HIV disease cases, 7,181 had severe HIV disease, and 3,541 were HIV cases. During 1996, 845 cases of severe HIV disease and 536 HIV cases were reported. For severe HIV disease cases reported in Missouri residents during 1996, the rate was 16.5 cases per 100,000 population; in comparison, the United States severe HIV disease (AIDS) rate in 1996 was 25.2.

After an apparent plateau period in the early 1990s, the number of annually reported cases of severe HIV disease in Missouri has increased during the past two years. See Figure 4. The 845 cases of severe HIV disease reported during 1996 represented a 9.9 percent increase over the 769 cases reported in 1995. Early diagnosis of HIV infection and aggressive treatment with recommended combination therapies may, over time, contribute to decreases in the annual numbers of reported cases of severe HIV disease.

It is estimated that there are currently 8,000–11,000 persons with HIV living in Missouri. Included here are reported HIV disease cases, as well as individuals who have not yet been diagnosed and reported to public health officials. A notable development in 1996 was that the St. Louis metropolitan area, with a severe HIV disease rate of 18.8 per 100,000 population, became one of the top 50 large metropolitan areas having the highest annual rates of reported severe HIV disease cases. See Table 1 on page 26.

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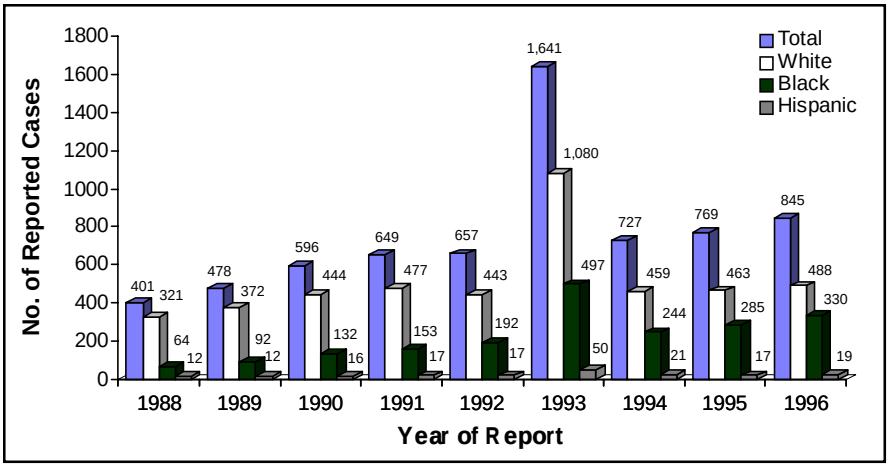

Figure 4. Reported severe HIV disease (AIDS) cases by race/ethnicity and year of report, Missouri, 1982–96.

*The NIH Consensus Development Program was established in 1977 as a mechanism to resolve in an unbiased, impartial manner, controversial issues in medicine and public health.

** Syringe exchange refers to interventions where sterile needles are provided to drug users in exchange for used needles. The purpose of syringe exchange is to prevent reuse of needles and facilitate interaction with public health services, with the goal of preventing infection and transmission of HIV and assisting drug users in gaining access to drug treatment.

(continued from page 25)

HIV Disease by Gender

The substantial majority of HIV disease cases continue to be reported in males. Of the 7,181 cumulative cases of severe HIV disease which have been reported through 1996, 6,642 (92.5%) were males. However, females have slowly but progressively been making up a larger proportion of annually reported cases, and in 1996 comprised 11.6 percent of cases reported. Females also appear to be making up a higher proportion of more recently infected persons, as indicated by the fact that females represent 14.3 percent of cumulative HIV cases, but only 7.5 percent of cumulative severe HIV disease cases.

HIV Disease by Race and Ethnicity

Whites make up a majority of reported HIV disease cases (68.1% of cumulative cases of severe HIV disease, and 51.9 percent of cumulative HIV cases, with white males contributing 64.4 percent of all severe HIV disease cases and 46.2 percent of all HIV cases). However, African Americans, along with Latino males, are overrepresented in the epidemic. The rate per 100,000 population for both severe HIV disease and HIV cases is much higher in African Americans than in whites, with Latinos having intermediate rates. For severe HIV disease cases reported in 1996, the rate in whites was 11.0 per 100,000; in African Americans, 60.5 per 100,000; and in Latinos, 30.8 per 100,000. However, the total number of reported severe HIV disease cases in Hispanics, 189, is much lower than the 4,888 cases reported in whites and the 2,054 cases reported in African Americans. Of the 189 reported Hispanic cases, 183 (96.8%) are in males.

The annual number of reported severe HIV disease cases has, in general, continued to increase for both whites and African Americans since the beginning of the epidemic. However, during the past eight years, the rate of increase in annually reported cases has been noticeably higher for African Americans compared to whites. From 1995 to 1996, the annual number of reported cases of severe HIV disease in African Americans increased by 15.8 percent (from 285 to 330 cases), whereas the increase among whites was 5.4 percent (from 463 to 488 cases). See Figure 4.

Table 1. Metropolitan Areas* With the 50 Highest AIDS Annual Rates per 100,000 Population—United States, January–December 1996.

Metropolitan Area of Residence	Rate	Metropolitan Area of Residence	Rate
New York, NY	120.1	Las Vegas, NV	28.9
Miami, FL	99.4	Oakland, CA	28.5
Jersey City, NJ	97.7	Norfolk, VA	28.2
San Francisco, CA	95.0	Memphis, TN	27.3
West Palm Beach, FL	85.4	Austin, TX	26.9
Fort Lauderdale, FL	83.6	Rochester, NY	26.5
Newark, NJ	73.9	Middlesex, NJ	26.1
San Juan, Puerto Rico	70.4	Seattle, WA	26.1
Baltimore, MD	61.6	San Antonio, TX	25.7
Baton Rouge, LA	58.5	Richmond, VA	25.6
New Orleans, LA	58.2	Nassau-Suffolk, NY	24.3
Washington, D.C.	47.3	Nashville, TN	24.1
Atlanta, GA	46.4	Chicago, IL	23.8
Houston, TX	45.3	Louisville, KY	23.4
Wilmington, DE	43.4	Birmingham, AL	22.7
Los Angeles, CA	40.7	Monmouth-Ocean, NJ	22.7
New Haven, CT	37.3	Riverside-San Bernardino, CA	21.7
Orlando, FL	37.2	Denver, CO	20.9
San Diego, CA	37.1	Sarasota, FL	20.8
Jacksonville, FL	36.5	Albany-Schenectady, NY	20.7
Bergen-Passaic, NJ	36.1	Tucson, AZ	20.4
Tampa-St. Petersburg, FL	36.1	Boston, MA	19.0
Hartford, CT	34.1	**St. Louis, MO**	**18.8**
Philadelphia, PA	33.9	Portland, OR	18.5
Springfield, MA	33.5	Providence, RI	18.5
Dallas, TX	29.3		

*Includes only metropolitan areas with a population ≥500,000. Metropolitan areas are named for a central city or county, may include several cities and counties, and may cross state boundaries.

HIV Disease by Age Group

Among cumulative reported cases of severe HIV disease, the largest percentage (45.9%) were diagnosed between the ages of 30–39; the second largest percentage (23.4%) were diagnosed between the ages of 20–29. Among cumulative reported HIV cases, the largest percentage (41.3%) were diagnosed between the ages of 20–29; the second largest percentage (37.5%) were diagnosed between the ages of 30–39.

Of total reported HIV cases, 4.7 percent (167 cases) were diagnosed in teenagers; this includes 16.3 percent of all HIV cases reported from African American females, 10.3 percent from white females, 4.7 percent from African American males and 2.2 percent from white males. In addition, some HIV disease cases who were first diagnosed in their twenties were likely to have been initially infected while in their teens.

HIV Disease by Exposure Category

Men who have sex with men (MSM) continue to comprise the largest numbers of reported HIV disease cases; in 1996, 62.0 percent of reported cases of severe HIV disease, and 54.3 percent of reported HIV cases, were in MSM. See Table 2. However, among persons more recently infected with HIV, a smaller proportion appear to have been infected through male homosexual contact. In addition, reported cases of severe HIV disease in MSM have shown evidence of plateauing in recent years, although this has not been seen in cases from African

Table 2. Reported HIV Disease by Exposure Category, 1982–1996

	HIV Cases*				Severe HIV Disease (AIDS) Cases**				Total HIV Disease Cases	
	Reported 1996		Cumulative		Reported 1996		Cumulative		Cumulative	
Exposure Category										
MSM	291	(54.3%)	2,079	(58.7%)	524	(62.0%)	5,068	(70.6%)	7,147	(66.7%)
MSM/IDU	21	(3.9%)	231	(6.5%)	68	(8.0%)	652	(9.1%)	883	(8.2%)
IDU	33	(6.2%)	379	(10.7%)	93	(11.0%)	629	(8.8%)	1,008	(9.4%)
Heterosexual Contact	79	(14.7%)	466	(13.2%)	88	(10.4%)	449	(6.3%)	915	(8.5%)
Adult Hemophiliac	2	(0.4%)	26	(0.7%)	5	(0.6%)	138	(1.9%)	164	(1.5%)
Adult Transfusion	2	(0.4%)	15	(0.4%)	7	(0.8%)	96	(1.3%)	111	(1.0%)
Other/Unknown Adult	104	(19.4%)	307	(8.7%)	56	(6.6%)	92	(1.3%)	399	(3.7%)
Perinatal Transmission	4	(0.7%)	31	(0.9%)	3	(0.4%)	38	(0.5%)	69	(0.6%)
Other/Unknown Pediatric	0	(0.0%)	7	(0.2%)	1	(0.1%)	19	(0.3%)	26	(0.2%)
Missouri Total	**536**	**(100.0%)**	**3,541**	**(100.0%)**	**845**	**(100.0%)**	**7,181**	**(100.0%)**	**10,722**	**(100.0%)**

*HIV Cases-Persons with HIV infection who have not developed one of the specific diseases or conditions which would cause them to meet the case definition for AIDS.
**AIDS Cases-Persons with HIV infection who have developed one or more of the specific diseases or conditions which cause them to meet the AIDS case definition.

American MSM, where the annual number of reported cases has continued to increase. In 1996, African American men made up 34.0 percent of severe HIV disease cases reported in MSM.

Men who have sex with men and inject drugs (MSM/IDU) comprised 8.1 percent of severe HIV disease cases, and 3.9 percent of HIV cases, reported in 1996. No clear upward or downward trends have been apparent among reported cases of severe HIV disease in MSM/IDU in recent years. During the past five years, the proportion of annually reported MSM/IDU cases of severe HIV disease contributed by African American men has remained generally constant in the range of 30–37 percent.

Injecting drug users (IDUs) comprised 11.1 percent of severe HIV disease cases, and 6.2 percent of HIV cases, reported in 1996. The annual number of reported cases of severe HIV disease in IDUs has generally continued to increase; the 93 cases reported in 1996 represented a 22.4 percent increase over the 76 cases reported in 1995. This general upward trend has occurred in both African Americans and whites. African Americans make up 50.2 percent of total reported cases of severe HIV disease in IDUs.

Heterosexual contacts comprised 10.5 percent of severe HIV disease cases, and 14.8 percent of HIV cases, reported in 1996. The annual number of reported cases of severe HIV disease in heterosexual contacts has continued to increase; the 88 cases reported in 1996 represented a 14.3 percent increase over the 77 cases reported in 1995. This upward trend in reported cases has, in general, occurred in both African Americans and whites (although in 1996, eight fewer white cases were reported than in 1995). For two of the past three years, African Americans have made up over 60 percent

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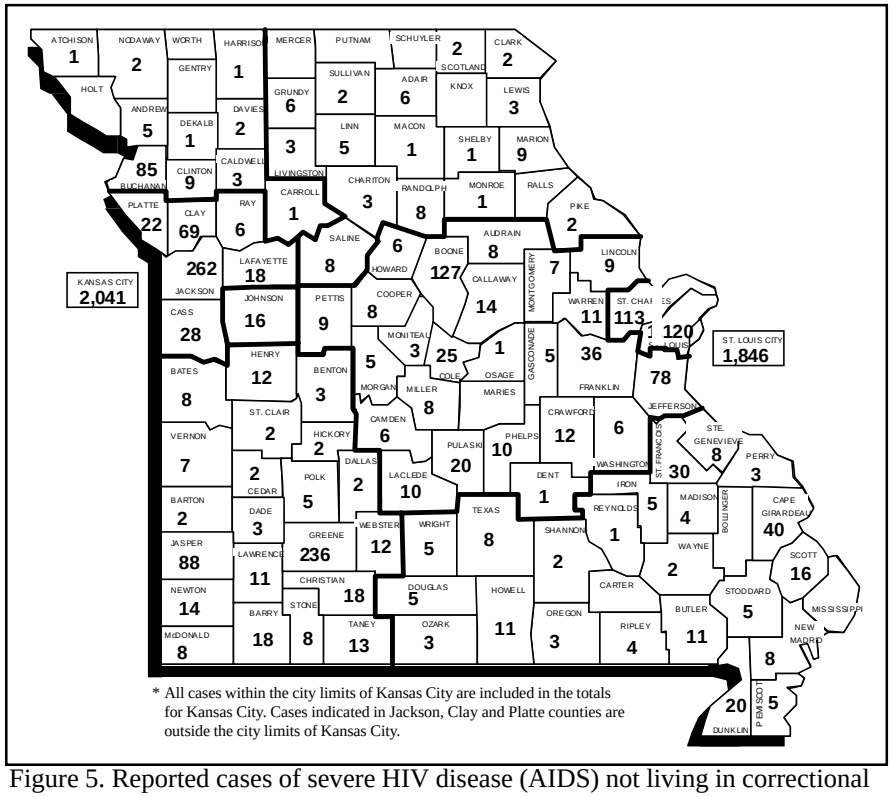

Figure 5. Reported cases of severe HIV disease (AIDS) not living in correctional facilities at time of diagnosis by county, Missouri, cumulative through 1996.

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of reported cases of severe HIV disease in heterosexual contacts (63.6% of cases reported in 1996). In addition, African Americans appear to be making up a larger proportion of more recently infected persons who acquired their HIV infection through heterosexual contact.

A total of 38 perinatal cases* of severe HIV disease and 31 perinatal HIV cases have been reported, including three severe HIV disease cases and four HIV cases reported in 1996. Almost all recent infections in children have been the result of perinatal transmission.

HIV Disease by Geographic Area

Missouri has been divided into seven geographic regions for purposes of HIV prevention community planning. These regions are outlined in Figure 5, which also shows the total number of reported severe HIV disease cases by county. Of the 7,181 total severe HIV disease cases reported, 3,079 (42.9%) were from the three-county St. Louis Planning Region (SLPR), and 2,446 (34.1%) were from the six-county Kansas City Planning Region (KCPR). These two regions have also had the highest rates of severe HIV disease (26.8 and 21.3 per 100,000 population, respectively in 1996). The geographic location (by zip code area) of cumulative HIV cases and severe HIV disease cases in St. Louis City and County are shown in Figures 6 and 7. For more information on HIV disease in specific zip codes for the St. Louis region, please contact the Metropolitan St. Louis AIDS Program at (314) 658-1159.

HIV Disease: Treatment and Prevention

Increasingly effective treatments for HIV disease have become available in recent months, and appear to significantly increase the survival rates of many HIV-infected persons. Treatment of HIV disease is now based on combination therapy with antiretroviral drugs. As more is learned about HIV and the mechanisms

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* Perinatal cases are the result of HIV transmission from an HIV infected mother to her infant before or at the time of birth.

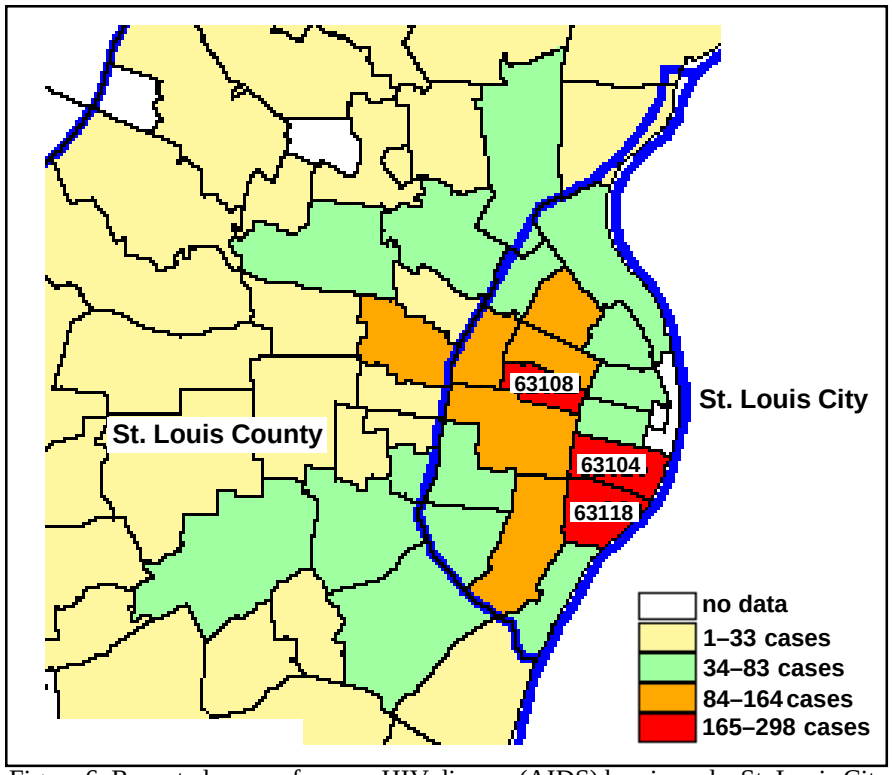

Figure 6. Reported cases of severe HIV disease (AIDS) by zip code, St. Louis City and County, cumulative through 1996.

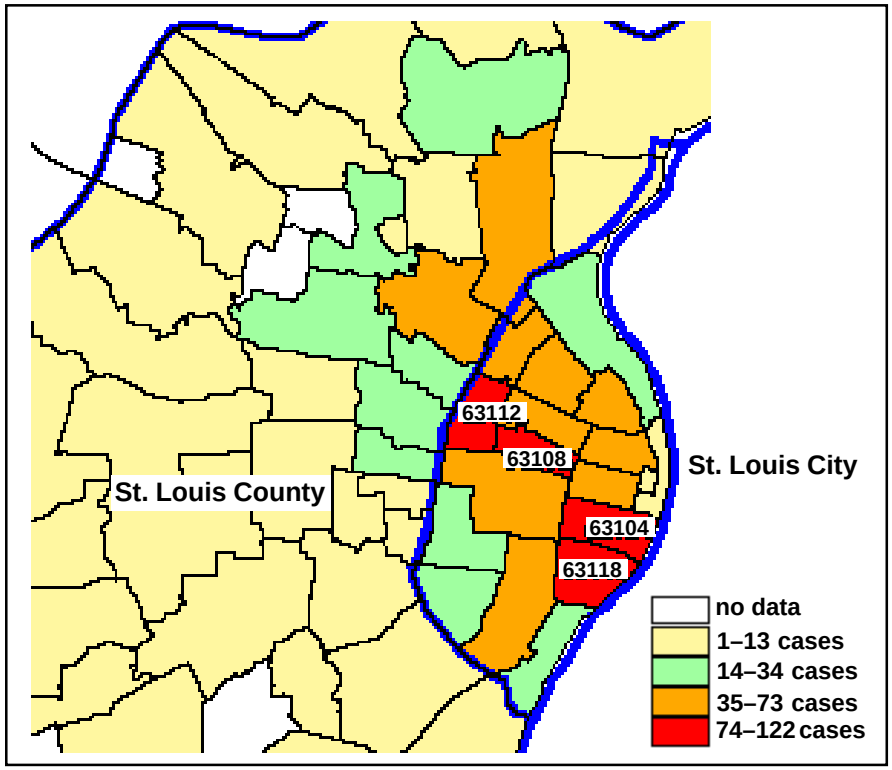

Figure 7. Reported HIV cases by zip code, St. Louis City and County, cumulative through 1996.

Bureau of Communicable Disease Control 1996 Annual Report

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meningitis have steadily decreased since 1993. Active surveillance for Hib disease was done in 1992 and 1993 as part of the Invasive Bacterial Disease Project. Evidence from this project suggests that reporting of invasive Hib disease other than meningitis in Missouri is incomplete.

REFERENCE:

1. CDC. E coli O157:H7–what the clinical microbiologist should know. March 1994.

Table 1. Most common *Salmonella* serotypes, Missouri, 1996 and 1995

	1996			1995		
	Serotype	No. of Cases	Percent	Serotype	No. of Cases	Percent
1.	*S. typhimurium*	134	23.7%	*S. typhimurium*	129	22.4%
2.	*S. enteritidis*	64	11.3%	*S. enteritidis*	83	14.4%
3.	*S. braenderup*	46	8.1%	*S. newport*	38	6.6%
4.	*S. newport*	36	6.4%	*S. javiana*	32	5.5%
5.	*S. heidelberg*	23	4.1%	*S. heidelberg*	28	4.9%
6.	*S. javiana*	12	2.1%	*S. muenchen*	13	2.3%
7.	*S. infantis*	11	1.9%	*S. poona*	13	2.3%
8.	*S. oranienburg*	10	1.8%	*S. bareilly*	11	1.9%
9.	*S. poona*	10	1.8%	*S. saint paul*	9	1.6%
10.	*S. agona*	8	1.4%	*S. braenderup*	8	1.4%
11.	*S. thompson*	8	1.4%	*S. oranienburg*	8	1.4%
				S. hadar	8	1.4%
	All Others	203	36.0%	All Others	197	34.1%
	Total	**565**	**100.0%**	**Total**	**577**	**100.0%**

STDs and HIV—1996

(continued from page 28)
by which it causes disease, and as additional drugs become available, there is reason to hope that the treatment of HIV disease will become even more effective. However, two key points need to be emphasized. First, treatment recommendations for HIV infection are highly complex and continually changing. Because of this complexity, all HIV-infected persons should be under the care of a medical provider who has expertise in treating this condition, or who is treating the individual in consultation with another provider who has such expertise. Second, these therapeutic advances, although highly encouraging, do not represent a cure, and do not work for all HIV-infected persons. Consequently, there must be continued emphasis on prevention of new infections.

Communities throughout Missouri continue to offer HIV testing to populations of greatest epidemiologic risk through community outreach venues. Clinicians are encouraged to perform a risk assessment for HIV infection and other sexually transmitted diseases (STDs) on all patients. In addition, clinicians are strongly urged to offer counseling to their patients regarding behavioral risks for HIV infection, and to offer HIV testing. Clinicians caring for pregnant women should universally offer HIV counseling and voluntary testing to these patients. If a pregnant woman is found to be infected with HIV, she should be offered appropriate treatment to reduce the risk of perinatal transmission. The Department of Health's Policy to Reduce the Risk of Perinatal HIV Transmission in Missouri was printed in the March/April 1996 issue of the *Missouri Epidemiologist*.

For more information about STDs, including HIV disease, in Missouri, please call toll free 1 (800) 359-6259. The home page for the Centers for Disease Control and Prevention's Center for HIV, STD and TB Prevention is at http://www.cdc.gov/nchstp/od/nchstp.html. In addition, two free sources of information for medical providers caring for HIV-infected persons are the HIV Telephone Consultation Service from San Francisco General Hospital (1-800-933-3413) and the Public Health Service's HIV/AIDS Treatment Information Service (1-800-HIV-0440).

HIV Treatment Guidelines

New recommendations for the treatment of HIV disease and the prevention of opportunistic infections in HIV-infected persons have been issued:

- Carpenter C, Fischl M, Hammer S, et al: Antiretroviral therapy for HIV infection in 1997: Updated recommendations of the International AIDS Society—USA Panel, JAMA 1997;277:1962–69.
- CDC. 1997 USPHS/IDSA guidelines for the prevention of opportunistic infections in persons infected with human immunodeficiency virus. MMWR 1997;46(No. RR-12). (Available at http://www.cdc.gov/epo/mmwr/mmwr_rr.html.)

In addition, the federal government has recently released two draft documents addressing the treatment of HIV disease: *Report of the NIH Panel to Define Principles of Therapy of HIV Infection* and *Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents*. Both draft documents are available at http://www.cdcnac.org or http://www.hivatis.org. DHHS is seeking public comment on these two drafts through July 21, 1997. After consideration of the comments, the final documents will be published in the *MMWR*.

Hazardous Substances Emergency Events Surveillance 1996 Annual Report*

Lori J. Harris
Bureau of Environmental Epidemiology

The Hazardous Substances Emergency Events Surveillance (HSEES) system, established by the Agency for Toxic Substances and Disease Registry (ATSDR) in 1990, collects information on the direct public health impact of emergency events involving hazardous substances. Missouri's HSEES program has completed its third year of data collection. As the program continues, new notification sources are explored and information is shared and analyzed to determine the public health impact of emergency events involving the release of hazardous substances in the state of Missouri.

All Missouri HSEES data are transmitted to ATSDR for analysis and comparison along with the data collected from the other 13 participating states. Personal/company identifiers are not transmitted to ATSDR to protect the confidentiality of program participants.

Because the intent of the HSEES program is to reduce the morbidity and mortality related to hazardous substances emergency events, it is important that the public, emergency responders, employees and industries receive feedback information concerning case investigations. In those cases where development of intervention strategies might prevent similar future incidents, specific summary investigation reports are prepared and distributed to the community involved. When appropriate, health education programs to promote prevention strategies are conducted for the affected industry, local emergency planning committees, emergency responders, etc.

This report was supported by funds from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) trust fund provided to the Missouri Department of Health under Cooperative Agreement Number U61/ATU780955-02 from the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.

Case Definition for Hazardous Substance Release

A hazardous substance release is entered in the HSEES system if it meets the following criteria:

1. An uncontrolled or illegal release or threatened release of one or more hazardous substances; and
2. The substances that are actually released or threatened to be released include ALL hazardous substances except petroleum products; and
3. The quantity of the hazardous substances which are released, or are threatened to be released, need (or would need) to be removed, cleaned up, or neutralized according to federal, state or local law; or
4. Only a threatened release of hazardous substances exists, but this threat leads to an action such as an evacuation that can potentially impact on the health of employees, responders or the general public. This action makes the event eligible for inclusion into the surveillance system even though the hazardous substances are not released.

Analysis of Data on Hazardous Substances Emergency Events

The Missouri Department of Natural Resources' Environmental Services Program maintains Environmental Emergency Response (EER) reports. All environmental emergencies are to be reported, 24 hours a day, to (573) 634-2436. A total of 1,715 reports were received in 1996 (January 1 through December 31, 1996). Of these, 862 (50%) were petroleum related. There were 200 (12%) potential hazardous substances emergency events. The remaining 653 (38%) incidents involved releases of sewage, solid waste, nonhazardous substances, non-emergency releases, etc. A hazardous substance release is entered into the HSEES system only if it meets the case definition for a hazardous substance release. See sidebar.

In addition, the HSEES program receives fax reports from the United States Coast Guard's National Response Center (NRC) on a daily basis. A total of 91 potential hazardous substances emergencies in Missouri were reported through this source. Of these 91 reports, 23 (25%) met the HSEES case definition and were entered in the HSEES database. Other notification sources include reports from the Missouri Highway Patrol, the Missouri Occupational Fatality Assessment and Control Evaluation Program (MOFACE) and the media.

Of the 298 events received from all sources and investigated by the HSEES Coordinator, 178 were entered into the

HSEES database. Only 161 (90%) of those events met the case definition and were counted in 1996. Fourteen (8%) of the investigations entered were events that occurred in 1995, and three events did not meet the case definition.

The 161 events involved the release of 177 hazardous substances. The majority of events (150/93%) involved the release of only one hazardous substance. The most commonly released substance was ammonia with 34 (21.1%) releases; followed by PCB's and sulfuric acid with 10 (6.2%) releases, each; paint with 7 (4.3%) releases; and ethylene glycol, hydrochloric acid, nitric acid and nitrogen with 6 (3.7%) releases, each.

Events occurred throughout the state, involving 54 counties and St. Louis City. This represents slightly under 50% of the counties of the state. Figure 1 shows the number of events occurring in each county.

One hundred ten (68%) of the events occurred at fixed facilities, while 51 events (32%) were transportation related. Of the 161 events, 140 (87%) occurred on weekdays. Twenty-one events (13%) occurred on the weekend. Slightly over half the events, 92 (57%), occurred between 6 a.m. and 6 p.m., with 67 (42%) occurring between the core working hours of 8 a.m. and 5 p.m., Monday–Friday. Eighteen (11%) occurred between midnight and 6 a.m. and 29 (18%) occurred between 6 p.m. and midnight. Time of event was unknown for 22 (14%) events.

Evacuations were ordered in 12 (7.5%) events. The number of people evacuated was known for eight events and unknown for four events. The eight known events resulted in 1,830 people being evacuated. In any single evacuation, the largest number of known people evacuated was 1,200 and the smallest number was five. Six of the evacuations involved the evacuation of affected building(s) or part of the building, five were downwind evacuations and one was a combination circle/downwind evacuation.

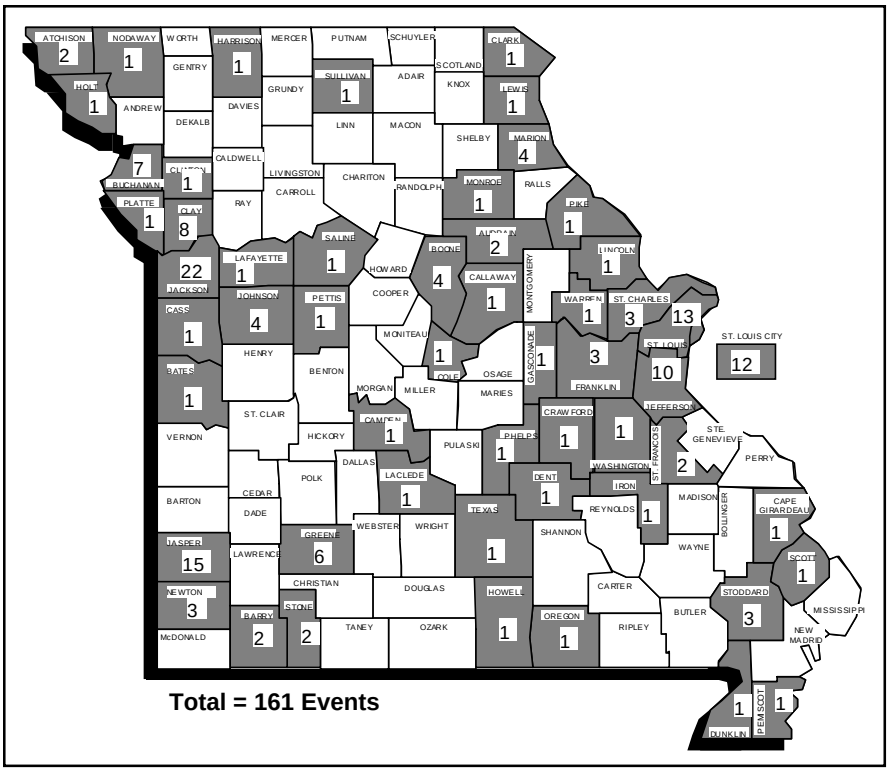

Figure 1. Location of non-petroleum hazardous substances emergency events by county, Missouri, 1996.

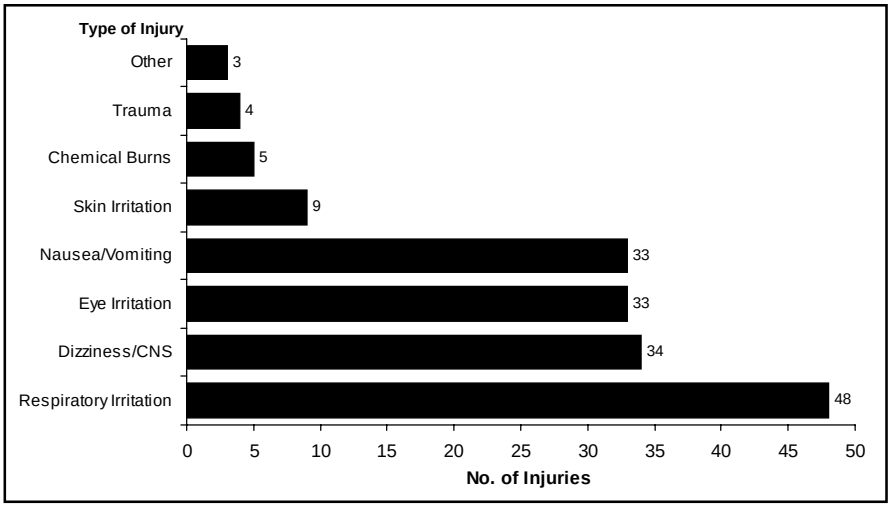

Figure 2. Number of injuries reported by type, Missouri HSEES, 1996.

A total of eight hazardous substances were released in the 12 events involving evacuations. Ammonia was the most commonly released substance, occurring in six events involving a total of 1,275 known evacuees. Chlorine was released in two events involving a total of 340 known evacuees. Nitric acid and potassium hydroxide were released in one event involving 200 evacuees, hydrogen sulfide was released in one event involving ten evacuees and methyl mercaptan was released in one event involving five evacuees. Toluene and dimethyl sulfide were released in one event involving an unknown number of evacuees.

Twelve (7.5%) events resulted in 59 victims, including two deaths. The largest number of victims associated with a release was 29. The most common type of injury reported was respiratory

(continued on page 32)

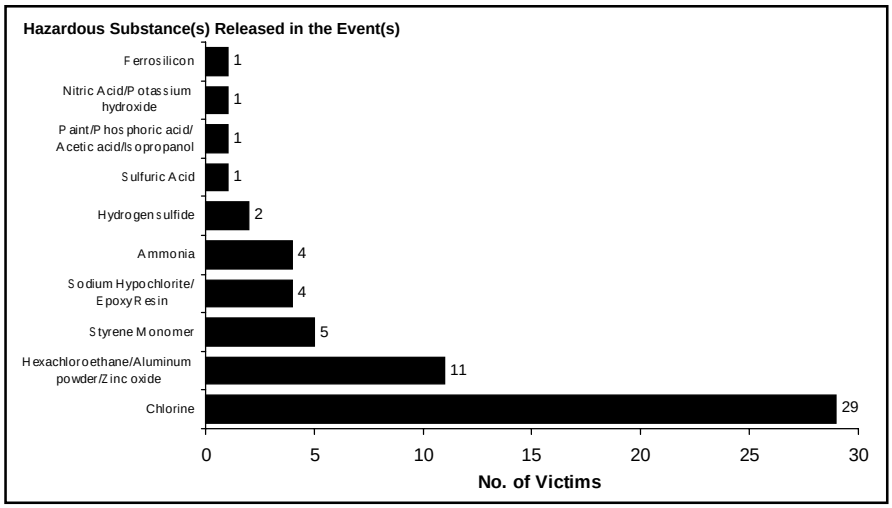

Figure 3. Number of events involving victims by hazardous substance released, Missouri HSEES, 1996.

(continued from page 31)

irritation, which occurred in 48 (81%) of the victims. Other types of injuries/ symptoms included eye irritation, chemical burns, thermal burns, skin irritation, dizziness/CNS, nausea/ vomiting, trauma and other. See Figure 2.

Of the 59 victims, two victims died, 20 were treated at the scene, 13 were transported to a hospital but not admitted, and 24 were admitted to a hospital. The two deaths occurred in two separate transportation-related events, and it could not be determined if the deaths were attributable to the hazardous substances released (styrene monomer and ferrosilicon) or the trauma of the accident.

Employees were the largest group injured by hazardous substances releases again this year. Forty-nine employees, three responders, one police officer and four members of the general public were injured. Two employees died. A chlorine release in a paint booth resulted in 29 (49%) injuries. In one event, a malfunction in the training equipment during a fire drill caused a release of hexachloroethane, aluminum powder and zinc oxide that resulted in 11 (19%) injuries. Styrene monomer was involved with five (8%) injuries in one event. Ammonia was involved with four (7%) injuries in three events. In another event, a release of sodium hypochlorite and epoxy resin resulted in four (7%) injuries. Hydrogen sulfide was involved with two (3%) injuries in one event. The remaining hazardous substances were involved with one injury, each. See Figure 3.

Reporting Events

We are indebted to the Missouri Department of Natural Resources' Environmental Services Program for helping us investigate these hazardous substances emergency events. We rely heavily on this unit for notification of releases and frequently contact them for circumstances surrounding a release.

If you are aware of any emergency events involving the release of non-petroleum, hazardous substances that may not have been reported to the Missouri Department of Natural Resources, please contact:

Lori J. Harris, HSEES Coordinator
Missouri Department of Health
P.O. Box 570
Jefferson City, MO 65102-0570
Ph: (573) 751-6111 or
(800) 392-7245

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Mar 97	Apr 97	Total YTD
Specimens Tested	9,422	10,027	37,856
Initial (percent)	63.7%	64.8%	24,327
Repeat (percent)	36.3%	35.2%	13,529
Specimens: Unsatisfactory	224	228	898
HT Borderline	874	830	3,514
HT Presumptive	24	24	85
PKU Borderline	0	2	3
PKU Presumptive Positive	0	2	3
GAL Borderline	38	42	152
GAL Presumptive Positive	3	4	10
FAS (Sickle cell trait)	71	94	311
FAC (Hb C trait)	20	23	90
FAX (Hb variant)	17	18	61
FS (Sickle cell disease)	1	0	3
FSC (Sickle C disease)	2	2	6
FC (Hb C disease)	0	0	1

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Tuberculosis and Ultraviolet Light Therapy: A Bright Idea for Building Partnerships

Vic Tomlinson, M.P.A.
Bureau of Tuberculosis Control

James J. McEnroe, Ph.D.
Electric Power Research Institute
Health Care Initiative

Summary

Since the mid-1980s, the marked increase in the incidence of new cases of *Mycobacterium* tuberculosis in the United States has focused the medical community's attention on low-cost, effective strategies to prevent the transmission of tuberculosis (TB). Although TB rates have declined over the past three years, it continues to be a public health concern. The use of ultraviolet (UV) light has emerged as a relatively inexpensive and effective means of preventing the spread of tuberculosis—and other airborne diseases such as measles—in a variety of high-risk environments.

A unique public-private partnership was formed in Missouri during 1996 to address the need for environmental controls in some high-risk facilities. Union Electric in collaboration with the Electric Power Research Institute Health Care Initiative (EPRI HCI) brought together a task force consisting of the St. Louis City, St. Louis County and Missouri Departments of Health, Union Electric, EPRI HCI and others. The project should shed light on the effectiveness of UV lighting in reducing TB transmission rates. However, just as crucial, the project brought together public and private entities in a creative coalition to address a shared health problem. Together they provide a model for partnership at a time when it is more important than ever to develop cooperative efforts among state, federal, corporate and community organizations.

Introduction

Bolstered by the increase in AIDS and other immunosuppressive diseases, as well as an increase in the number of persons in at-risk populations, TB reemerged in the 1980s as a public health concern for many United States communities. At a time of financial constraints, it is crucial that community health authorities, corporations, researchers and others find cost-effective and clinically effective ways to partner and share resources.

Inspired by a national project developed by EPRI, a coalition of member electric power utilities, a St. Louis-based task force was convened to identify, implement and study one potential low-cost means of preventing the spread of TB: ultraviolet germicidal irradiation (UVGI). The task force brought together a variety of collaborators: the local electric power utility—Union Electric, the Missouri Department of Health, St. Louis City and County health authorities, a community health nurse from the Grace Hill Neighborhood Health Center, clinicians from Washington University School of Medicine, consultants, architects and engineers. Together they identified several high-risk institutions in the state of Missouri, three in the St. Louis area and one in a smaller, mid-state city.

The institutions include two homeless shelters, a large medical center that serves high-risk patients and a state correctional facility. According to 1995 data, the Department of Corrections had a TB positivity rate of 14.3 percent among inmates and employees combine.

(continued on page 34)

Ultraviolet Research

In the 1930s, Dr. Richard Riley conducted research at Johns Hopkins University that clearly demonstrated ultraviolet light's efficacy for germicidal irradiation in the laboratory. But with the advent of drug therapies, that research lay dormant for 60 years. Today, Riley's work is commanding new attention from such experts as Dr. Edward Nardell of Harvard Medical School, Dr. Jonathan Freeman of the Harvard School of Public Health, and Dr. Melvin Furst, a Harvard-based expert in ventilation. Dr. Phillip Brickner of St. Vincent's Hospital in New York has been conducting similar research in homeless shelters for over a decade and believes the ultraviolet approach shows extraordinary promise.

For more information see:

Centers for Disease Control and Prevention. Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities, 1994. MMWR 1994;43(RR-13).

Nardell Edward A MD. Environmental Control of Tuberculosis. Tuberculosis 1993;77(6).

Riley Richard L MD and Nardell Edward A MD. Controlling Transmission of Tuberculosis in Health Care Facilities: Ventilation, Filtration, and Ultraviolet Air Disinfection. Plant Technology and Safety Management Series 1993.

Weisman Ellen. Engineering Controls and TB: What Works and How Well? Health Facilities Management 1994;7(2).

(continued from page 33)
A study of 30 St. Louis homeless shelters from 1993–95, including the two that are part of the UVGI project, found TB positivity rates as follows: 14.6 percent in 1993, 18.8 percent in 1994 and 15 percent in 1995.

The project's goal is to install UV lights throughout each target organization or at least in key transmission areas. For example, at the urban medical center, UV lights will be installed in the emergency room, dialysis center and public waiting room. UV lighting is being installed in the visiting area at the correctional center, and lights are planned in congregant areas in the homeless shelters. The program's efficacy will be monitored on a month-to-month basis by examining TB conversion rates for inmates, patients, and employees.

Ultraviolet Germicidal Irradiation: Controversial—But Worth a Look

Although UVGI has traditionally been considered somewhat controversial, there are references in the literature indicating that UVGI effectively eradicates TB pathogens. Beginning with early research in the 1930s at the Johns Hopkins University by Dr. Richard Riley, by Harvard's Dr. Edward Nardell in homeless shelters and Dr. Phillip Brickner in the 60s and 70s showing that TB bacilli are killed by UV irradiation, data on the use of UVGI have shown TB transmission rates reduced by as much as 95–99 percent. See sidebar on page 33. The Missouri task force decided to implement the UVGI project as a means of preventing transmission as well as a research project because it is low-cost (as opposed to other methods such as High-Efficiency Particulate Air [HEPA] filtration) and modest in scope. The project will also contribute significantly to national TB research by gathering current and baseline data from the various settings in which the strategy is employed.

Project Methodology

The project was planned in three phases:

Phase 1: Identify and assess facilities that were willing to participate and in which UVGI could be installed. This phase was conducted during 1996 and is now complete.

Phase 2: Track skin test conversion rates and active TB in the clients and residents of the facilities in order to document the effects of UVGI. TB conversion rates will be submitted every month for a year from the Department of Corrections annual employee screening data.

Phase 3: Analyze data, prepare manuscripts and present the data. It is estimated that it will take six months to complete this phase.

Facilities were selected based on their suitability for installation of upper-room UVGI as well as availability of residents/patients and health services. The project utilizes short wave (254 nm) UV bulbs. UV fixtures will primarily be installed in upper room areas, but where upper room UVGI is impractical because of low ceiling heights (eight feet or less), self-contained UV ceiling units with equivalent room air disinfection capabilities will be substituted. UVGI's effectiveness is maximized when used along with HEPA filtration systems. Ventilation and room air mixing, crucial factors in TB transmission by infectious droplet—and also crucial to the germicidal effect of UVGI—will be quantified seasonally in each facility, along with humidity, also assumed to be influential in UVGI's potential germicidal effects. Quantitative data are also being examined on shelter design, volume, alteration, usage and population density. Fans may be installed when appropriate to maximize the germicidal effectiveness of UVGI irradiation.

Dr. Thomas Bailey, Assistant Professor in the Division of Infectious Diseases at the Washington University School of Medicine, will oversee the data collection and observation process. He will use a two-step system to analyze the data—the group of methods generally referred to as statistical process control. He will look at conversion rates at month-to-

Helpful Hints for Workable Partnerships

- Examine the issues or problems that need to be addressed—and the resources available in the community to address them.
- Choose a do-able task. Don't be concerned about whether it's modest or magnificent! Just do it!
- It's not mandatory to have a huge role. Be a facilitator. DO what you can!
- Share power equally with all players. Likewise, share responsibilities with all players.
- View the common health issue or shared concern as "everyone's concern," and take a team approach.
- Use education and awareness for communicating public health concerns (and prevention) to the community.

month intervals from the Department of Corrections and use the historical data as a benchmark. This graphically displays the conversion rate over time among the people who were tested. This technology will not replace traditional means of infection control, but could be a relatively low-cost way of preventing institutional TB transmission.

Anatomy/Evolution of a Partnership

What is perhaps most instructive and useful in the UVGI trial thus far is that the process provides a creative model for a public-private partnership. The task force evolved as a modest idea for a systemic response that deals with a shared, common health problem from the community, technological and clinical perspectives. A committee began to meet in early 1995 to identify an issue, reducing TB transmision, that seemed attainable. As the UVGI/TB idea came to light, appropriate individuals and groups were identified and invited to sit at the table, including the local electric utility, Union Electric. Individuals from the private sector were helpful in examining financial and technical issues. Community health groups brought in clinicians who understood public health problems. The committee found that each group or individual had its own unique perspectives and resources to offer, and tasks were accomplished more efficiently because power was shared equally by all involved. The committee learned a variety of valuable, practical lessons. Helpful hints for a workable partnership are offered in the sidebar on this page 34.

Project Funding

The Missouri UVGI trial is sponsored through collaborative support from the project partners. Additional support including funding will be obtained, if needed, from various sources such as foundations and other philanthropic sources. Due to variations in facility shape and construction, costs vary for installation of state-of-the-art UV lights. However, the cost is considerably less than HEPA filtration systems and far less than treating TB after active infection. For example, treating a TB patient in the United States costs about $2,000 for outpatient treatment, including medication and monitoring for six months or longer. Treating a case of drug-resistant TB can cost $250,000 or more.

Prognosis and Future Applications

TB continues to be a problem both for metropolitan and for rural areas. Until prevention strategies such as UVGI and others effectively reduce the rate of TB transmission, and until solutions are found to combat new drug-resistant TB strains, TB will continue to be at the forefront of public health concerns. Results from initiatives like this will be of interest.

While the Missouri project is taking place, UVGI is being employed in a variety of institutions throughout the United States—in a national trial and in correctional facilities, hospitals and homeless shelters in areas like New York City, Kansas City, Houston and Birmingham, Alabama, where there have been hundreds of active cases of TB over the past two years. If the data show a reduction in the rate of TB transmission, the use of UV lights could prove to be a cost-effective technology that will have possible applications to other sites such as group homes and public housing units.

The Missouri task force believes that the ease with which the project was conceived and implemented will inspire more successful public-private partnerships and coalition-building in other communities. The project brought together an assortment of parties from the public and private sectors who contributed financial support, clinical data, and epidemiological resources. They found that the study is a great way to mobilize and empower the community—to let *them* decide what's best for *them*. As federal, state and local resources continue to tighten, such joint projects will also help to control—and perhaps finally—to eliminate TB and address other public health issues.

For more information, contact the Bureau of Tuberculosis Control at (573) 751-6122.

For information on the EPRI Health Care Initiative or the TB Project, contact the EPRI Regional Office at (314) 863-1011 or the EPRI National Office at (800) 424-EPRI.

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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

LATE BREAKERS

- On June 11, 1997, Governor Mel Carnahan appointed Dr. Maureen Dempsey to the position of Director of the Missouri Department of Health. Dr. Dempsey has been with the department for six and one-half years and most recently served as Chief of the Bureau of Immunization. Ron Cates will resume his duties as Deputy Director. They can be reached at (573) 751-6001, or you can reach Mr. Cates by e-mail at CatesR@mail.health.state.mo.us.

- The Department of Health recently received notification that some shielding products used for radiation protection contain lead contaminated with very small amounts of radioactive materials. The lead came from another country to a company in Missouri which provided it to the manufacturer of the shielding products. The products include medical devices used in leaded aprons, gonad shields and thyroid shields manufactured after October 1, 1996. Consumers acquiring such products, should contact the manufacturer for further information.

- There is currently an advisory for sunfish, carp, redhorse and other suckers found in the Big River in St. Francois and Jefferson counties and the Flat River in St. Francois County. These fish have been found to contain high levels of contaminants such as lead and mercury. Sampling since 1992 indicate that catfish no longer pose a health risk. It has been recommended, however, that people do not eat carp, redhorse or suckers from the Big River downstream from Desloge to the mouth of the river. For further information, contact the Bureau of Environmental Epidemiology at (800) 392.7245.

- In May 1997, the Missouri Legislature called upon the Department of Health to create an organization which would adequately address the needs of Missourians at risk for and living with HIV. In the effort to fully assess the needs of Missourians for comprehensive HIV prevention and care services, the department will engage in a series of planning discussions with key community partners during July and August 1997. For more information, please contact the Bureau of STD/HIV Prevention at (800) 358-6259 or (573) 526-4565.

Missouri EPIDEMIOLOGIST

Volume 19, Number 4 *July-August 1997*

Dr. Maureen Dempsey Named State Health Director

Mary Kay Hager
Office of Public Information

On June 11, Dr. Maureen Dempsey took over the top post at the Department of Health. With her appointment, she brings a wealth of knowledge, expertise and firsthand experience.

In fact, her clinical experience working with premature and critically ill babies led her to a career in public health. After finishing her medical school residency in child health and Neonatal Fellowship at the University of Missouri-Columbia (UMC) Health Sciences Center in June 1988, she worked as a staff physician at two St. Louis area hospitals. During her training and the two and one-half years she worked in the emergency room and nursery, she saw firsthand the problems and obstacles that families face. She became board certified in General Pediatrics in 1990.

"I saw the same recurring themes for those I cared for, such as lack of prenatal care, substance abuse, battered families, low income and lack of immunizations," Dr. Dempsey said. "All of these things led to my desire to become more involved directly."

Dr. Dempsey began her state career in 1991 as medical director for the Division of Maternal, Child and Family Health, serving as interim division director for five months in 1993. She joined the Community Health Assessment Resource Team (CHART) in 1994 and for the next two years played a key role in designing the medical components and building the program up from the ground floor. In May 1996, she was named the chief of the Bureau of Immunization. During her tenure at the bureau, the state's immunization rates rose 12 percent in one year's time. She also has been an assistant professor in the UMC Department of Child Health in the Health Sciences Center.

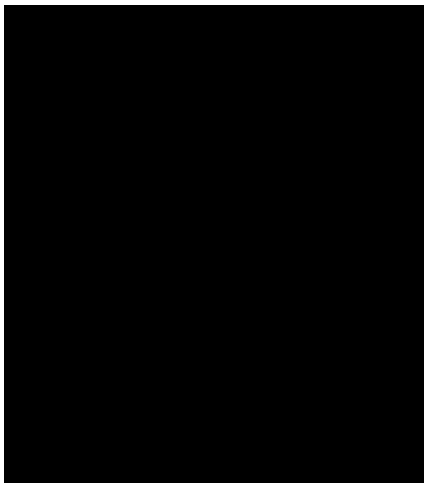
As she takes over the reins, Dr. Dempsey will give high priority to addressing a top public health concern in Missouri—access to health care and the quality of the health care that's provided. Another of her main goals for the department will be defining our public health mission.

"We are the only ones qualified to determine our position in the overall health care system," she said. "We must remain focused and find out what will have the best impact on the people we serve."

Dr. Dempsey plans to practice clinical medicine one day a week at the Family Health Center in Columbia. Her area of focus is in primary care with children.

"I feel it is extremely important to continue to work one-on-one with the people," she said. "It's the best way to see how the broad-based policies and programs we implement at the state level affect the patients and the health care providers."

Although running the department will take a lot of time, she also feels it is



important to find time for some of the outdoor activities she enjoys, including canoeing, hiking and camping. She also likes reading and playing the piano.

Dr. Dempsey and her husband, Michael Rovetto, Ph.D., live in Columbia. She has two stepchildren, Bernard Rovetto, 26, and Michelle Rovetto, 24.

Inside this Issue...

Vaccine-Preventable Diseases - January–June 1997

Georgia Storm, R.N.
Bureau of Immunization

Even as immunization rates continue to increase at the state and national levels, surveillance of the incidence of vaccine preventable diseases is as important as ever. Children continue to contract these diseases each year. The only effective way to decrease or eliminate them is to identify as many cases as possible and develop strategies in response to the circumstances in which they occur.

The Bureau of Immunization has compiled the data for the first half of 1997 (January–June) for all reported vaccine-preventable diseases in Missouri.

There were 24 confirmed and five probable cases of pertussis investigated in Missouri from January through June 1997. See Figure 1. During the same reporting period in 1996, 17 cases were reported. Sixteen of the confirmed cases and all five probable cases reported in 1997 were infants under 6 months of age. Between January 1 and March 1, 1997, the Centers for Disease Control and Prevention (CDC) received reports of 682 cases of pertussis nationwide. Unlike Missouri, the increase in pertussis cases reported nationwide was in individuals 10 years of age and older. Some of the reasons for the increase may be physicians' increased awareness, early recognition and diagnosis of pertussis, as well as enhanced surveillance and more complete reporting.

For the first half of 1997, one case of measles was reported and confirmed in Linn County. See Figure 1. This was a 4-year-old with documentation of two doses of MMR. The State Public Health Laboratory began using the IgM capture EIA test for measles and rubella on April 14, 1997. Prior to this, they had used the direct ELISA, which can miss low level IgM specimens and has a higher rate of false positives than the IgM capture EIA. Specimens should be collected five to six days after rash onset so that the IgG antibodies do not interfere, thus giving a false negative result. Three suspect cases tested positive using the ELISA test, two were retested using the IgM capture EIA and were found to be negative. During the first half of 1996, two measles cases were reported in Gasconade County.

There have been no confirmed cases of rubella, mumps or *Haemophilus influenzae* type B during the first half of 1997. During the first half of 1996, one case of *Haemophilus influenzae* type B was reported but no rubella or mumps.

The Bureau of Immunization forwards weekly information regarding vaccine-preventable diseases to the Centers for Disease Control and Prevention in Atlanta, Georgia through the National Electronic Telecommunications Surveillance System (NETSS).

If you have questions or need additional information about vaccine-preventable diseases, please contact Georgia Storm at (573) 751-6133.

Attention:
Vaccine for Children Providers

Vaccine for Children (VFC) providers have had questions about the age limit for VFC-eligible children. All children ages 0 through 18 years who meet the other VFC criteria are qualified.

This interpretation means VFC vaccine can be given after the 18th birthday, but prior to the 19th birthday.

If you have questions, please call the VFC Program at (800) 219-3224.

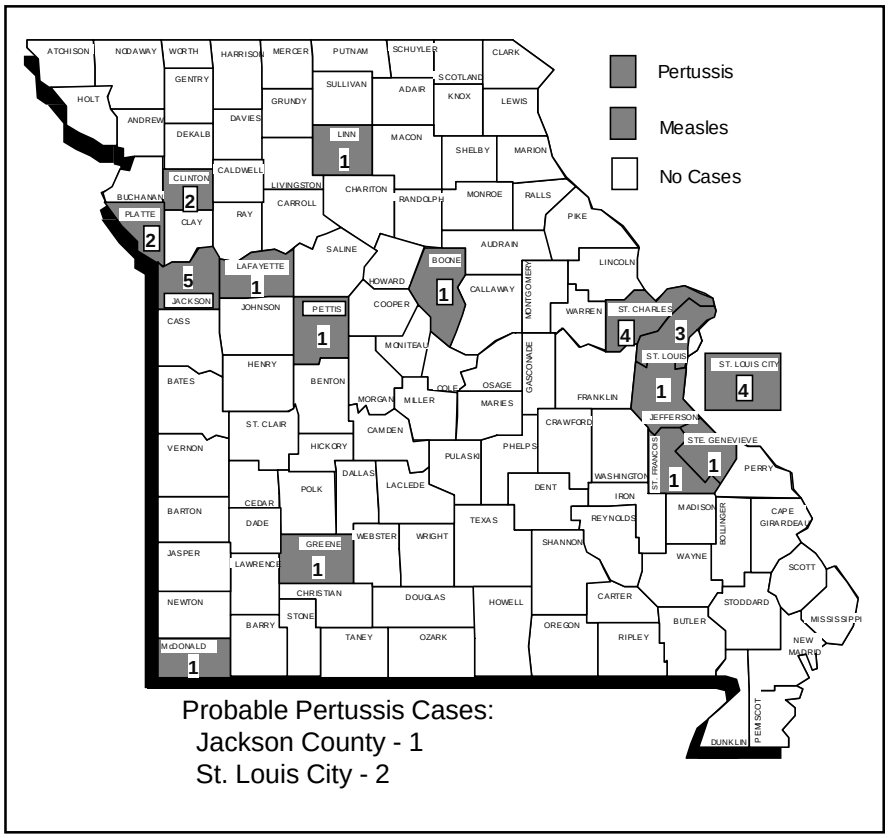


Figure 1. Reported vaccine-preventable diseases, Missouri, January–June 1997

New Case Definitions for Notifiable Diseases

Bureau of Communicable Disease Control

The Centers for Disease Control and Prevention (CDC) has published revised case definitions for infectious disease surveillance. These definitions have been recommended by both CDC and the Council of State and Territorial Epidemiologists (CSTE), and they have been endorsed for use by the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD). "Case Definitions for Infectious Conditions Under Public Health Surveillance" was printed in the May 2, 1997 issue of the *Morbidity and Mortality Weekly Report (MMWR) Recommendations and Reports*, Vol. 46, No. RR-10. The primary purpose of this document is to provide state health departments with uniform case definitions for reporting morbidity data to CDC. Over 40 revised case definitions were adopted in 1996.

Uniform case criteria were first published by CDC in October 1990 in order to increase the specificity of reporting and improve the comparability of diseases reported from different geographic areas.

These definitions are not intended to be used as the sole criteria for establishing clinical diagnoses, determining the standard of care necessary for a particular patient, setting guidelines for quality assurance or providing standards for reimbursement; neither should they be used as the only criteria for public health action. A medical provider may diagnose a disease with the use of additional clinical, epidemiologic and laboratory data, even though the formal surveillance case definition may not be met and the case cannot be entered into the national database.

Definition of Terms Used in Case Classification

Clinically Compatible Case: a clinical syndrome generally compatible with the disease, as described in the clinical description.

Confirmed Case: a case that is classified as confirmed for reporting purposes.

Epidemiologically Linked Case: a case in which

a) the patient has had contact with one or more persons who either have / had the disease or have been exposed to a point source of infection (i.e., a single source of infection, such as an event leading to a foodborne-disease outbreak, to which all confirmed case-patients were exposed) and

b) transmission of the agent by the usual modes of transmission is plausible.

A case may be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.

Laboratory-Confirmed Case: a case that is confirmed by one or more of the laboratory methods listed in the case definition under Laboratory Criteria for Diagnosis. Although other laboratory methods can be used in clinical diagnosis, only those listed are accepted as laboratory confirmation for national reporting purposes.

Probable Case: a case that is classified as probable for reporting purposes.

Supportive or Presumptive Laboratory Results: specified laboratory results that are consistent with the diagnosis, yet do not meet the criteria for laboratory confirmation.

Suspected Case: a case that is classified as suspected for reporting purposes.

Hepatitis C, Acute, and Hepatitis non-A, non-B, Acute

Hepatitis C is being categorized as a disease distinct from non-A, non-B hepatitis. According to the case definition, a diagnosis of hepatitis C requires that a test for antibody to hepatitis C virus (anti-HCV) is positive and verified by a supplemental test. To meet the case definition for non-A, non-B hepatitis, a test for anti-HCV (if done) must be negative. In addition, for either acute hepatitis C or acute non-A, non-B hepatitis to be diagnosed, the following criteria must also be met: *An acute illness with a) discrete onset of symptoms and b) jaundice or elevated serum aminotransferase levels.*

Additional laboratory criteria must also be met for both diseases:

1. *Serum aminotransferase levels >2.5 times the upper limit of normal, and*
2. *IgM anti-HAV negative, and*
3. *IgM anti-HBc negative (if done) or HBsAg negative.*

According to CDC, up to 20 percent of acute hepatitis C cases will be anti-HCV

(continued on page 4)

(continued from page 3)
negative when reported, and will be classified as non-A, non-B hepatitis. This is due to the fact that some (5–10%) have not yet seroconverted and others (5–10%) remain seronegative even with prolonged follow-up. Available serologic tests for anti-HCV do not distinguish between acute, chronic or past infection. Consequently, other causes of acute hepatitis should be excluded for anti-HCV positive patients who have an acute illness compatible with viral hepatitis.

Legionellosis

Previously, a Legionellosis case was categorized as either confirmed or probable, but in the new definition, the category, "probable case," has been eliminated because it was based on a single IFA titer, which lacks the necessary specificity for surveillance. A case of Legionellosis is now classified only as, "confirmed," which is defined as "a clinically compatible case that is laboratory confirmed." *Legionellosis is associated with two distinct illnesses: either Legionnaire disease, which is characterized by fever, myalgia, cough, pneumonia; or Pontiac fever, a milder illness without pneumonia*.

Laboratory criteria for diagnosis are:

1. Isolation of *Legionella* from respiratory secretions, lung tissue, pleural fluid or other normally sterile fluids, or
2. Demonstration of a fourfold or greater rise in the reciprocal immunofluorescence antibody (IFA) titer to ≥1:128 against *Legionella pneumophila* serogroup 1 between paired acute-and convalescent-phase serum specimens, or
3. Detection of *L. pneumophila* serogroup 1 in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody testing, or
4. Demonstration of *L. pneumophila* serogroup 1 antigens in urine by radioimmunoassay or enzyme-linked immunosorbent assay.

Table 1. Infectious Diseases Designated as Notifiable at the National Level, United States, 1997.

- Acquired immunodeficiency syndrome (AIDS)
- Anthrax
- Botulism
- Brucellosis
- Chancroid
- *Chlamydia trachomatis*, genital infections
- Cholera
- Coccidioidomycosis
- Cryptosporidiosis
- Diphtheria
- Encephalitis, California serogroup
- Encephalitis, eastern equine
- Encephalitis, St. Louis
- Encephalitis, western equine
- *Escherichia coli* O157:H7
- Gonorrhea
- *Haemophilus influenzae*, invasive disease
- Hansen disease (leprosy)
- Hantavirus pulmonary syndrome
- Hemolytic uremic syndrome, post-diarrheal
- Hepatitis A
- Hepatitis B
- Hepatitis, C/non-A, non-B
- HIV infection, pediatric
- Legionellosis
- Lyme disease
- Malaria
- Measles
- Meningococcal disease
- Mumps
- Pertussis
- Plague
- Poliomyelitis, paralytic
- Psittacosis
- Rabies, animal
- Rabies, human
- Rocky Mountain spotted fever
- Rubella
- Rubella, congenital syndrome
- Salmonellosis
- Shigellosis
- Streptococcal disease, invasive Group A
- *Streptococcus pneumoniae*, drug-resistant invasive disease
- Streptococcal toxic-shock syndrome
- Syphilis
- Syphilis, congenital
- Tetanus
- Toxic-shock syndrome
- Trichinosis
- Tuberculosis
- Typhoid fever
- Yellow fever

Table 2. Infectious Diseases and Conditions That Are Not Nationally Notifiable but for Which Case Definitions May be Useful for Surveillance*, United States, 1997.

- Amebiasis
- Aseptic meningitis
- Bacterial meningitis, other
- *Campylobacter* infection
- *Cyclospora* infection
- Dengue fever
- Ehrlichiosis
- Genital herpes (herpes simplex virus)
- Genital warts
- Giardiasis
- Granuloma inguinale
- Leptospirosis
- Listeriosis
- Lymphogranuloma venereum
- Mucopurulent cervicitis
- Nongonococcal urethritis
- Pelvic inflammatory disease
- Rheumatic fever
- Tularemia
- Varicella (chickenpox)

* This list includes only the diseases and conditions that are not nationally notifiable for which case definitions are provided in the CDC report (MMWR 1997;46[RR-10]); it is not a complete list of such diseases for which CDC and state and territorial health departments maintain surveillance systems.

Streptococcal Disease, Invasive, Group A

Streptococcal Disease, Invasive, Group A is clinically described as *invasive group A streptococcal infection which may manifest as any of several clinical syndromes, including pneumonia, bacteremia in association with cutaneous infection (e.g., cellulitis, erysipelas, or infection of a surgical or nonsurgical wound), deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis, and nonfocal bacteremia*. In addition, to meet the case definition, there must be laboratory confirmation consisting of *isolation of group A Streptococcus (*Streptococcus pyogenes*) by culture from a normally sterile site (e.g., blood or cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid).*

Streptococcus pneumoniae, Drug-Resistant Invasive Disease

Streptococcus pneumoniae, Drug-Resistant Invasive Disease is a CDC notifiable disease, although not currently reportable in Missouri. However, there is considerable interest in this organism nationwide, and any practitioner or laboratory identifying a case meeting the following level of resistance should report it to the Department of Health in order that a database can be maintained.

S. pneumoniae *causes many clinical syndromes, depending on the site of infection (e.g., acute otitis media, pneumonia, bacteremia, or meningitis).* According to the revised case definition, cases may be classified as either confirmed or probable.

A confirmed case is defined as *a clinically compatible case that is laboratory confirmed*. Laboratory confirmation requires:

1. Isolation of *S. pneumoniae* from a normally sterile site (e.g., blood, cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid), and
2. "Nonsusceptible" isolate (i.e., intermediate- or high-level resistance of the *S. pneumoniae* isolate to at least one antimicrobial agent currently approved for use in treating pneumococcal infection.

Resistance [as used in this definition] *is defined by National Committee for Clinical Laboratory Standards (NCCLS)-approved methods and NCCLS-approved interpretive minimum inhibitory concentration (MIC) standards (mg/mL) for* S. pneumoniae. *NCCLS recommends that all invasive* S. pneumoniae *isolates found to be "possibly resistant" to beta-lactams (i.e., an oxacillin zone size of <20 mm) by oxacillin screening should undergo further susceptibility testing by using a quantitative MIC method acceptable for penicillin, extended-spectrum cephalosporins, and other drugs as clinically indicated.*

A probable case is defined as *a clinically compatible case caused by laboratory-confirmed culture of* S. pneumoniae *identified as "nonsusceptible" (i.e., an oxacillin zone size of <20 mm) when oxacillin screening is the only method of antimicrobial susceptibility testing performed.*

Aseptic Meningitis

Aseptic meningitis has been removed from CDC's list of notifiable infectious diseases, but it remains a reportable disease in Missouri. It should always be investigated when clusters or outbreaks are evident to the local health department. The clinical description is *a syndrome characterized by acute onset of meningeal symptoms, fever and cerebrospinal fluid pleocytosis, with bacteriologically sterile cultures*. Aseptic meningitis is a syndrome of multiple etiologies, but many cases are caused by viral agents. A case is considered "confirmed" if it is *a clinically compatible case diagnosed by a physician as aseptic meningitis, with no laboratory evidence of bacterial or fungal meningitis.*

A complete copy of "Case Definitions for Infectious Conditions Under Public Health Surveillance" can be obtained through CDC's website at http://www.cdc.gov/epo/mmwr/other/case_def/about.html. The document can be viewed using Adobe Acrobat Reader. This free software can be downloaded from http://www.adobe.com/prodindex/acrobat/download.html.

As knowledge increases and diagnostic technology improves, some case definitions will change to reflect those trends.

The Department of Health (DOH) must rely on health-care providers, infection control professionals, laboratories and other public health personnel to report the occurrence of notifiable diseases. Without such reporting, DOH cannot respond to health professionals, the media and the public who desire information about current trends, unusual occurrences of diseases and the effectiveness of intervention activities. Data on reported cases of disease form the basis for the Bureau of Communicable Disease Control's policy decisions, and for the prioritizing and allocating of resources for disease prevention and control.

The Bureau of Communicable Disease Control sincerely appreciates the efforts of so many persons statewide who contribute to the data on reportable diseases so that the derived information can be meaningfully used on behalf of the citizens of Missouri.

Reporting forms can be obtained by contacting your local health department or calling the Bureau of Communicable Disease Control at (800) 392-0272 or (573) 751-6113.

Big River Mine Tailings Superfund Site Lead Exposure Study

Scott Clardy
Bureau of Environmental Epidemiology

The Centers for Disease Control and Prevention (CDC) has described childhood lead poisoning as one of the most common preventable environment-related health problems for children in the United States today. Enough is now known about sources and pathways of lead exposure for the CDC to establish a national goal to end the problem of lead poisoning by the year 2012. Sources of lead exposure include air, food, water, dust and soil. Throughout history, lead has been widely used in paints, glazes, eating utensils, plumbing, medicines, and recently in vehicle batteries and gasoline. In addition, Missouri citizens have been exposed to lead through mining, milling and smelting of lead ore. Missouri ranks as the top lead-producing state in the nation.

Lead's poisonous effect on the health of humans, especially children, has been solidly proven by science and well documented in scientific literature. Consistent findings from numerous extensive studies indicate that lead causes harmful health effects on the development of unborn babies and young children, including abnormal nervous system development, irregular physical growth and lowered IQ scores. Health and exposure studies have shown these harmful effects to be associated with elevated blood lead levels as low as ten micrograms of lead per one deciliter of blood (10 µg/dl).

The Big River Superfund Site is an old lead mining and milling area 70 miles south of St. Louis, Missouri. Prominent reminders of mining history remain today at the site which include six major tailings piles or ponds, several smaller tailings areas and numerous closed mines scattered throughout the 110 square mile Old Lead Belt area. Chat and tailings have been spread throughout the area by man and erosion. However, the greatest exposure to lead is from indoor dust, where contaminants are trapped, dispersed and settled over a confined area. This dust contains lead from both the mining area and lead-based paint in the home.

Table 1. Average Blood and Environmental Lead Levels, Big River Mine Tailings Superfund Site Lead Exposure Study, Missouri, 1997

Factor	Study Group	Control Group
Blood Lead (µg/dl)*	6.52	3.43
Lead in Water (µg/l)	2.38	3.55
Lead in Dripline Soil (µg/g)*	1794.62	625.62
Lead in Play Area Soil (µg/g)*	1282.28	127.15
Lead in Yard Soil (µg/g)*	1078.76	87.57
Lead Loading of Floor Cassette Vacuum (µg/ft^2)*	18.04	4.10
Lead Loading in Window Sill Dust Wipe (µg/ft^2)*	1641.52	196.95
Lead Concentration in Vacuum Bag (µg/g)*	1214.49	173.02

*Factor showed a statistically significant difference ($p < .05$) between the study and control groups.

In response to concerns that children living in the area were experiencing elevated blood lead levels, the Missouri Department of Health (DOH) conducted the Big River Mine Tailings Superfund Site Lead Exposure Study. The study was done in cooperation with the St. Louis University School of Public Health, the St. Francois County Health Department and the federal Agency for Toxic Substances and Disease Registry (ATSDR).

The Lead Exposure Study was conducted from 1995–97. The objective was to determine if children living in the Big River Mine Tailings Superfund Site area have blood lead levels higher than children living in a nearby non-mining area (control population), and how mining waste affects that increase.

Through an in-depth local-population census, eligible persons were randomly selected for participation in the study. To be eligible, candidates had to be between 6–90 months of age, and had to have been living at their current address in the defined study area for 60 days or more (one child was 92 months old, but was included because an incorrect date of birth was obtained during the census). Blood samples were obtained from the participants and analyzed for lead levels. In addition, the participants' parents or guardians were asked to complete a questionnaire that included information on the child and the household. Finally, environmental samples were taken to test for the presence of lead in drinking water, soil, house dust, vacuum cleaner bag dust and selected paint samples. Table 1 shows the average blood lead levels and selected environmental media found in both the study and control areas.

As can be seen in Table 1, lead levels were significantly higher in the study group for most environmental media. In addition, results indicate significantly more blood lead elevations in the study group compared to the control population. Seventeen percent of the children

in the study group had blood lead levels greater than or equal to 10 µg/dl, while only three percent of the children in the control group had blood lead levels of 10 µg/dl or greater.

The study results indicate that the elevated blood lead levels were a product of exposure to lead mining waste, lead-based paint and other sources in the area because the only substantial difference between the study and control areas in terms of exposure to lead is the presence of lead mining and mining waste. Based on these conclusions, the study makes the following recommendations:

1. Although mining waste accounts for the difference between the study and control areas, both lead paint and soil/dust lead were related to elevated blood lead levels. Blood lead levels can probably be lowered by reducing the exposure to mining waste and lead-based paint.
2. An educational and environmental intervention program that addresses both of these exposure sources should be initiated.
3. Future studies should focus on effective interventions to reduce exposure and on determining adverse neurobehavioral outcomes such as school achievement and IQ. X-ray fluorescence technology could be used to estimate long-term exposure to lead by measuring the accumulation of lead in bone. These measures of exposure could then be evaluated against markers of cognitive development.

Because of the increased lead levels in local soil and dust found in the study, DOH, along with federal and local health agencies, are informing parents in the study area of the increased risk of lead poisoning to their children. Because of these increased exposure levels, parents in the Big River Superfund Site area of St. Francois County should be encouraged to have their children's blood tested for lead at least once every six months. If two consecutive blood lead tests are less than 10 µg/dl, or if three consecutive tests are less than 15 µg/dl, then annual testing is recommended thereafter. Parents and physicians in the area can call the St. Francois County Health Department at (573) 431-1947 with questions about blood lead testing.

Parents should also keep in mind that personal and household cleanliness is a key to keeping lead exposure to a minimum, and children should be encouraged to play only in grassy areas.

Parents and other area residents should know that lead levels found in this area do not present an immediate health risk to children or adults. However, study results do show that if children ages 6 months to 6 years continue to be exposed to the elevated levels of lead in soil and dust, they are at increased risk of damage to their developing nervous systems. This could have a negative impact on the child's potential to achieve in school and the workplace.

Health care providers across Missouri, especially in lead-producing and/or urban areas, should be aware of the potential for childhood lead exposure. DOH recommends children have a blood lead test completed at 12 and 24 months of age. In addition, all children 6 to 72 months of age should be interviewed for risk factors by their health care provider, and if risk factors are identified, the child should be tested. If the child has an elevated blood lead level, venous blood lead levels should be done every six months until the level falls below 10 µg/dl for three consecutive tests.

Any questions regarding lead exposure or the Big River Mine Tailings Superfund Site Lead Exposure Study should be directed to Scott Clardy in the Bureau of Environmental Epidemiology at (800) 392-7245 or (573) 751-6404.

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	May 97	June 97	Total YTD
Specimens Tested	9,766	9,540	57,162
Initial (percent)	64.9%	64.0%	36,772
Repeat (percent)	35.1%	36.0%	20,390
Specimens: Unsatisfactory	270	179	1,347
HT Borderline	951	664	5,129
HT Presumptive	19	20	124
PKU Borderline	0	0	3
PKU Presumptive Positive	1	1	5
GAL Borderline	83	29	264
GAL Presumptive Positive	10	4	24
FAS (Sickle cell trait)	60	84	455
FAC (Hb C trait)	16	23	129
FAX (Hb variant)	12	10	83
FS (Sickle cell disease)	2	4	9
FSC (Sickle C disease)	0	0	6
FC (Hb C disease)	1	1	3

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Pre-Exposure Rabies Vaccination

F. T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

Consideration of pre-exposure rabies vaccination for individuals at high risk of exposure is highly recommended. Individuals who should be vaccinated against rabies include: veterinarians, veterinary technicians, animal control officers, trappers and spelunkers.

While pre-exposure rabies vaccination does not preclude the necessity of a modified regimen of post-exposure treatment after exposure to a known rabid animal (laboratory confirmed), it does protect the individual from incidental exposure.

The rabies vaccine has been shown to be 100 percent effective in immuno-competent individuals, when given via either intramuscular (IM) or intradermal (ID) route. Titer studies have shown that vaccinees attain adequate serum rabies neutralizing antibody titers of 0.5IU/ml or greater. In the United States, boosters are recommended every two to three years. In Europe, this vaccine is recognized as effective for a five-year period.

The pre-exposure vaccine regimen consists of three doses, given on a schedule of days 0, 7 and 28 by either the ID or IM route, using any of the human rabies vaccine products on the market.

Human rabies vaccines currently on the market are:

- IMOVAC I.D., HDCV (Supplied by Merieux-Connaught)
- IMOVAC I.M., HDCV (Supplied by Merieux-Connaught)
- Rabies Vaccine Adsorbed, I.M. (Supplied by Pfizer)

These are the same vaccines that are used in post-exposure treatments, with the exception of IMOVAC I.D., which is for pre-exposure vaccination only. The rabies vaccines are efficacious and safe; however, they are expensive. Physicians should be able to obtain these products from their local hospital pharmacies.

The Missouri Veterinary Medical Association has a program with the Missouri Department of Health to assist individuals who are having difficulty obtaining vaccine or getting vaccinated in their local area.

For more information about pre-exposure rabies vaccination, contact the Bureau of Veterinary Public Health at (573) 751-6136.

Availability of Diphtheria Antitoxin Through an Investigational New Drug Protocol

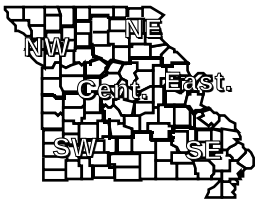
Although diphtheria is a rare disease in the United States, access to diphtheria antitoxin (DAT) is essential to ensure effective treatment of a case. The previously available supply of United States-licensed DAT (Diphtheria Antitoxin, Equine, Connaught Laboratories, Inc., Swiftwater, Pennsylvania) had an expiration date of January 6, 1997, and should no longer be used. No manufacturer has announced an intention to license a DAT product in the United States.

A DAT product (i.e., Diphtheria Antitoxin, Pasteur Merieux, Lyons, France), licensed in Europe and similar to the previously licensed United States product, is now available in the United States through an Investigational New Drug (IND) protocol through the Centers for Disease Control and Prevention (CDC). This protocol is designed to enable the emergency treatment of patients with suspected diphtheria. Decisions to dispense DAT from U.S. Public Health Service quarantine stations will be made by medical epidemiology staff of CDC's Child Vaccine Preventable Disease Branch, Epidemiology and Surveillance Division, National Immunization Program, in discussion with the treating physician.

Physicians treating a case of suspected diphtheria can contact the diphtheria duty officer at (404) 639-8255, 8 a.m. to 4:30 p.m. Eastern time, or (404) 639-2889, all other times.

All suspected diphtheria cases should also be reported to local and state health departments.

Reprinted from Morbidity and Mortality Weekly Report, May 2, 1997, Vol. 46, No. 17.



Missouri Department of Health
Division of Environmental Health and Communicable Disease Prevention
QUARTERLY REPORT

Reporting Period *
April - June, 1997

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	3 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1997	1996	FOR 1997	FOR 1996	5 YR MEDIAN
Vaccine Preventable Dis.																
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Hib Meningitis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	5
Hib Other Invasive	0	0	1	0	0	0		0	0	0	0	1	2	3	5	10
Influenza (lab confirmed)	0	12	6	0	0	0		0	0	2	2	22	23	228	155	163
Measles	0	0	0	0	0	0		0	0	0	0	0	1	1	2	1
Mumps	0	0	0	0	0	0		0	0	0	0	0	2	0	2	17
Pertussis	2	0	2	1	1	2		2	2	0	1	13	12	29	15	17
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1
Tetanus	0	0	0	0	0	0		0	0	0	0	0	0	0	1	0
Viral Hepatitis																
A	42	13	14	4	95	22		5	4	13	69	281	270	548	511	511
B	7	0	2	1	11	1		4	28	4	7	65	82	195	152	228
Non A - Non B	0	0	1	0	5	2		18	0	2	1	29	7	49	12	12
Unspecified	0	0	1	0	0	0		0	0	0	0	1	0	1	0	1
Meningitis																
Meningococcal	2	0	4	0	3	0		1	2	3	0	15	11	50	35	25
Enteric Infections																
Campylobacter	8	5	23	16	22	6		6	13	47	12	158	179	247	243	260
Salmonella	31	3	35	13	11	11		91	5	17	9	226	125	308	231	196
Shigella	5	1	23	10	1	2		6	3	2	0	53	80	124	225	238
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	1	0	1	1
Parasitic Infections																
Giardiasis	8	6	22	11	9	9		10	32	25	4	136	129	273	304	271
Sexually Transmitted Dis.																
AIDS	7	1	8	2	5	0	10	26	22	25	3	109	212	201	381	177
Gonorrhea	75	10	105	108	43	25		462	828	495		2151	1976	3723	4193	2901
Prim. & Sec. syphilis	0	0	0	2	0	1		0	15	11		29	50	51	143	255
Tuberculosis																
Extrapulmonary	0	0	2	0	0	0	0	3	3	6	0	14	8	20	12	10
Pulmonary	5	0	6	3	4	2	0	8	12	6	3	49	48	80	77	52
Zoonotic																
Psittacosis	0	0	0	0	0	0		0	0	0	0	0	1	0	1	1
Rabies (Animal)	0	0	0	5	0	0		0	0	0	0	5	6	11	14	10
Rocky Mtn. Sp. Fever	3	0	0	1	2	0		0	0	0	0	6	8	7	8	6
Tularemia	1	0	1	1	1	0		0	1	0	0	5	3	5	3	8

TEAR OUT FOR FUTURE REFERENCE

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis - 4
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 3
Legionellosis - 4
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 1
Trichinosis

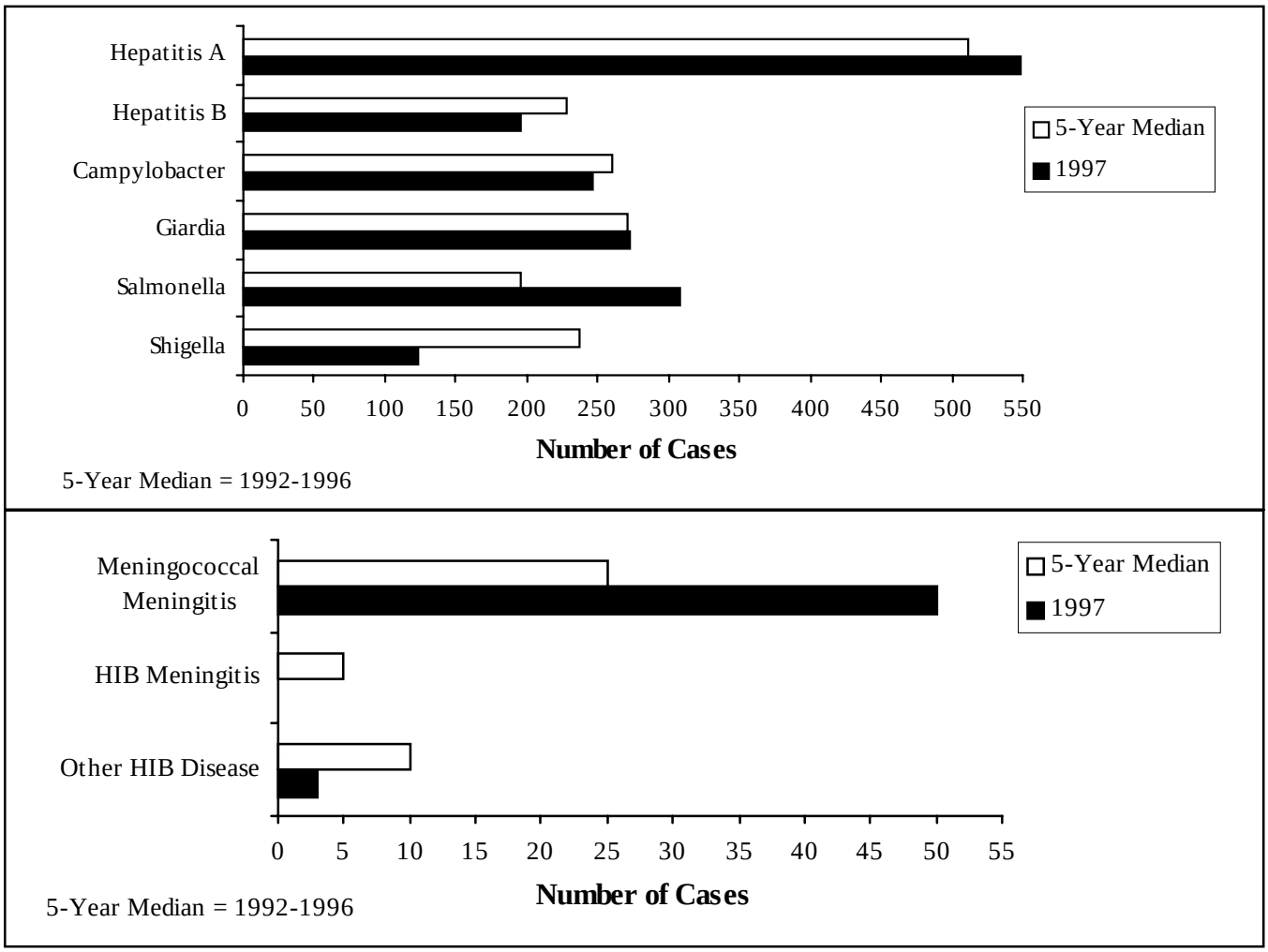
Outbreaks

Foodborne - 3
Waterborne
Nosocomial - 1
Other
Salmonella - 1
C. perfringens - 1
Norwalk-like - 1

*Reporting Period Beginning March 30, Ending June 28, 1997.
**Totals do not include KC, SLC, SLCo, or Springfield
***State and Federal Institutions

Due to data editing, totals may change.

Disease Reports, January–June 1997 and 5-Year Median



VIRAL HEPATITIS

The 548 cases of Hepatitis A reported during the January–June 1997 time period is an increase of 7.2%, from the 511 cases of Hepatitis A during January–June 1996. The bulk of the cases are still being reported from the Southwestern Health District. The number of cases for the six-month period for 1996 is the five-year median for the time period. Hepatitis B cases rose in 1997 by 28.3% for the six-month period, from 152 in 1996 to 195 in 1997, reversing a three-year trend. Hepatitis B is still 14.4% below the five-year six-month median for January–June of 228 cases.

ENTERICS

Campylobacter rose slightly by .16% during the monthly time period, from 243 cases in 1996 to 247 cases in 1997. It fell 5.0% from the five-year median of 260 cases. Salmonella increased by a third (33.3%) from 231 cases in 1996 to 308 cases in 1997. This is an increase of 57.1% over the five-year median of 196 cases. Surprisingly, shigellosis dropped by 44.9% from 225 cases in 1996 to 124 cases in 1997. It was 47.9 below the five-year median of 238 cases.

PARASITES

Giardiasis decreased by 10.2% from 304 cases during the 1996 monthly period to 273 in 1997. It is a slight increase of by 0.74% from the five-year median is 271 cases.

MENINGITIS

Meningococcal meningitis rose by 42.9% from 35 cases in 1996 to 50 cases in 1997. This is a 100.0% increase over the five-year median of 25 cases.

HIB DISEASE

No cases of Hib meningitis were reported for the period in 1997 and none in 1996. The five-year median is five cases. Other invasive Hib disease fell from five cases in 1996 to three cases in 1997, a drop of 40.0%. Other invasive Hib disease was made reportable in 1990 and there is now a January–June monthly five-year median for other invasive Hib disease. Other invasive Hib disease fell by 70.0% from the monthly five-year median of ten cases.

Discontinuation of Computer Bulletin Board System

Michael Fobbs, B.A.
Bureau of Communicable Disease Control

On September 30, 1997, the Bulletin Board System (BBS) provided by the Missouri Department of Health's Bureau of Communicable Disease Control will be discontinued.

The BBS was developed in 1995 to provide easy access for health care providers and the public to Department of Health information, particularly communicable disease information, in a quick, easy to update and easy to understand fashion.

This service was initiated because only a limited number of users had access to systems such as the Internet because they had no local Internet providers or commercial services such as America On-line to provide access.

The Department of Health now has an Internet homepage and many of the features available through the BBS are available through this web page. Providing access to the department homepage for users of the BBS was considered by the Bureau of Communicable Disease Control, but new methods of Internet access through phone companies, the expansion in the number of private Internet providers and limited resources within the Department of Health make it infeasible to continue to provide two separate public access channels.

The Department of Health homepage provides the following features:

- Statistical profiles for the state and individual Missouri counties which include monthly disease trends and summary demographic information about diseases by county as well as additional county information on
  - Causes of death
  - Socio-economic indicators
  - Causes of hospitalizations
  - Hospitals
  - Nursing homes
  - Population estimates
  - Maternal and child health status indicators
- Tuberculosis Control Manual
- *Missouri Epidemiologist* newsletter issues and indexes in Adobe Portable Document Format[¶] (PDF) back to 1992; issues for 1997 and indexes for 1992–96 are also available in Hypertext Markup Language (HTML) format
- All Department of Health news releases
- Prevention and wellness issues:
  - Family health
  - Prevention of heat-related illness
  - Nutrition services
  - Smoking and tobacco education
  - Tel-Link
- Department of Health organizational chart, directory of services and employment opportunities
- Listing of local public health agencies
- Directory of disease information
- Electronic versions of various Department of Health newsletters and publications
- Information on obtaining birth and death certificates
- Community health indicators
- Hospital licensing and certification regulations

The department homepage does not allow access to current and previous electronic versions of the Centers for Disease Control and Prevention's (CDC) *Weekly Morbidity and Mortality Weekly Report* (MMWR), but electronic versions of this publication are available free of charge via e-mail or through CDC's homepage. Details on obtaining this publication can be found in the * footnote on page 12 of this issue.

The BBS offered Live Chat areas where one could teleconference with other health professionals who were on-line. This feature is not available through the department homepage at this time.

Another feature offered by BBS was Mail Conferences where one could leave mail to discuss current issues, drug resistant diseases, general subjects, etc. This feature is also not available, but you can e-mail the department through the "Ask Me" feature of the homepage to request information on any topic.

Future items to be added to the department homepage include reference and educational information on HIV/AIDS, immunizations, sexually transmitted diseases and environmental epidemiology. This will include the 1994–95 Biennial Report of Reportable Diseases and Conditions and the HIV/AIDS KWIK Facts.

New items are being added to the DOH homepage every day, so take time to explore the homepage and let us know what additional information you would like to see added. We welcome your comments in our continuing effort to improve the homepage to suit your needs. If you have questions or comments, please call Harold Kirbey at (573) 751-6219 or e-mail him at kirbeh@mail.health.state.mo.us.

The Department of Health homepage can be found at www.health.state.mo.us.

[¶] To read Adobe Portable Document Format (PDF) documents, you need Adobe Acrobat Reader software which is available free of charge. Instructions on downloading the free software can be found at www.adobe.com/prodindex/acrobat/readstep.html.

1997–98 Recommendations for the Use of Influenza Vaccine

The following is a summary of current recommendations on influenza vaccine from the Advisory Committee on Immunization Practices (ACIP). The complete ACIP statement was published in *Morbidity and Mortality Weekly Report (MMWR) Recommendations and Reports*, Prevention and Control of Influenza, April 25, 1997, Vol. 46, No. RR-9.*

Influenza vaccine is strongly recommended for any person 6 months of age or older who is at increased risk for complications of influenza. Members of high risk groups, if they become ill, are more likely than the general population to require hospitalization. The following persons are at highest risk. They and their close contacts should be targeted for organized vaccination programs.

- Persons 65 years of age and older.
- Residents of nursing homes and other chronic-care facilities that house persons of any age with chronic medical conditions.
- Adults and children with chronic disorders of the pulmonary and cardiovascular systems, including asthma.
- Adults and children who required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies or immunosuppression (including immunosuppression caused by medications).
- Children and teenagers 6 months to 18 years of age who are receiving long-term aspirin therapy and, therefore, might be at risk for developing Reye syndrome after influenza.
- Women who will be in the second/third trimester of pregnancy during the influenza season.

Groups that can transmit influenza to persons at high risk should also be immunized. These groups include:

- Physicians, nurses and other personnel in both hospital and outpatient-care settings;
- Employees of nursing homes and chronic-care facilities who have contact with residents;
- Providers of home care to persons at high risk; and
- Household members (including children) of persons in high-risk groups.

Any person who wishes to reduce the likelihood of becoming ill with influenza should receive the vaccine.

The optimal time for organized vaccination campaigns for persons in high-risk groups is usually the period from October through mid-November. In the United States, influenza activity generally peaks between late December and early March. Administering vaccine too far in advance of the influenza season should be avoided, especially for nursing home residents, because antibody levels may begin to decline within a few months of vaccination.

Influenza vaccine should not be administered to persons known to have anaphylactic hypersensitivity to eggs or to other components of the influenza vaccine. Flu vaccine contains only noninfectious viruses, and cannot cause influenza. Respiratory disease after vaccination represents coincidental illness unrelated to influenza vaccination. The most frequent side effect of vaccination, reported by fewer than one third of vaccinees, is soreness at the injection site. Unlike the 1976 swine influenza vaccine, subsequent vaccines prepared from other virus strains have not been clearly associated with an increased frequency of Guillain-Barré syndrome.

The trivalent influenza vaccine prepared for the 1997–98 season will include A/Bayern/07/95-like (H1N1), A/Wuhan/359/95-like (H3N2), and B/Beijing/184/93-like hemagglutinin antigens. United States manufacturers will use the antigenically equivalent strains A/Johannesburg/82/96 (H1N1), A/Nanchang/933/95 (H3N2), and B/Harbin/07/94 because of their growth properties.

A summary of the 1996–97 influenza season in Missouri can be found on pages 14 and 15 of this issue.

Surveys indicate that less than one-half of the high-risk populations receive influenza vaccine each year.** More effective strategies are needed for delivering vaccine to persons at high risk and to their health-care providers and household contacts. Successful vaccination programs have combined education

* The Morbidity and Mortality Weekly Report (MMWR) is available free of charge in electronic format and on a paid subscription basis for paper copy ($118 per year). To receive an electronic copy on Friday of each week, send an e-mail message to listserv@listserv.cdc.gov. The body content should read SUBscribe mmwr-toc. Electronic copy also is available from CDC's World-Wide Web server at http://www.cdc.gov/epo/mmwr/mmwr.html or from CDC's file transfer protocol server at ftp.cdc.gov/pub/Publications/mmwr. To subscribe for paper copy, contact Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Ph: (202) 512-1800.

** In 1995, Medicare provided reimbursement for this vaccine for less than 42.9 percent of its beneficiaries. Local health agencies and nursing homes who are not currently Medicare providers may apply, through a simplified application process, for a special provider number which will allow them to receive reimbursement for influenza vaccine given to Medicare beneficiaries. Any questions about this process should be directed to the Bureau of Immunization at (573) 751-6133.

for health-care workers, publicity and education targeted toward potential recipients, a plan for identifying persons at high risk (usually by medical-record review) and efforts to remove administrative and financial barriers that prevent persons from receiving the vaccine.

Outpatient Clinics and Physicians' Offices

Staff in physicians' offices, clinics, health-maintenance organizations and employee health clinics should be instructed to identify and label the medical records of patients who should receive vaccine. Vaccine should be offered during visits beginning in September and throughout the influenza season. The offer of vaccine and its receipt or refusal should be documented in the medical record. Patients in high-risk groups who do not have regularly scheduled visits during the fall should be reminded by mail or telephone of the need for vaccine.

Facilities Providing Episodic or Acute Care

Health-care providers in these settings (e.g., emergency rooms and walk-in clinics) should be familiar with influenza vaccine recommendations. They should offer vaccine to persons in high-risk groups or should provide written information on why, where and how to obtain the vaccine.

Nursing Homes and Other Residential Long-Term-Care Facilities

Vaccination should be routinely provided to all residents of chronic-care facilities with the concurrence of attending physicians rather than by obtaining individual vaccination orders on each patient. Consent for vaccination should be obtained from the resident or a family member at the time of admission to the facility, and all residents should be vaccinated at one time, immediately preceding the influenza season. Residents admitted during the winter months after completion of the vaccination program should be vaccinated when they are admitted.

Acute-Care Hospitals

All persons 65 years of age or older, and younger persons (including children) with high-risk conditions who are hospitalized at any time from September through March, should be offered and strongly encouraged to receive influenza vaccine before they are discharged. Household members and others with whom they will have contact should receive written information about why and where to obtain influenza vaccine.

Visiting Nurses and Others Providing Home Care to Persons at High Risk

Nursing care plans should identify patients in high risk groups, and vaccine should be provided in the home if necessary. Caregivers and other persons in the household (including children) should be referred for vaccination.

Health Care Workers

Administrators of all health-care facilities should arrange for influenza vaccine to be offered to all personnel before the influenza season. Personnel should be provided with appropriate educational materials and strongly encouraged to receive vaccine. Particular emphasis should be placed on vaccination of persons who care for members of high-risk groups (e.g., staff of intensive care units [including newborn intensive care units], staff of medical/surgical units and employees of nursing home and chronic care facilities). Using a mobile cart to take vaccine to hospital wards or other

(continued on page 15)

LATE BREAKERS

- Immunization Postcards—Governor Mel Carnahan and the Department of Health are enlisting private physicians in an additional effort to protect young Missourians from vaccine-preventable diseases. The Governor is sending a postcard to all physicians in the state who provide immunizations, asking them to check their records and bring at least 10 children up to date on their immunizations. The number of immunizations provided should be recorded on the card and the card returned to the Department of Health.

- House Bill 904, passed in August 1996 requires health insurers to cover childhood immunizations for children birth to age 5 years with no co-payment or deductible. The Office of the Governor has directed the Department of Health and the Department of Insurance to collect the names of insurance companies that have denied payments for immunizations. **If you are aware of any such instances, please contact Bryan Norman in the Bureau of Immunization at (573) 751-6133 with the names of the insurance companies or health plans or fax the information to him at (573) 526-5220.**

- Dr. Marion Warwick started with the Bureau of HIV/AIDS Care and Prevention Services on July 1, 1997. Dr. Warwick will serve as the Medical Consultant for the bureau. For more information on the bureau, see the article on pages 18 and 19 of this issue.

1996-97 Influenza Summary

Harvey Marx, C.P.S.
Mary E. Kliethermes, R.N., B.S.
Bureau of Communicable Disease Control

The 1996–97 influenza season had an early onset, with the first laboratory-confirmed case of influenza (type B) reported on September 23, 1996, in an adult Jefferson County resident. There were a total of 417 laboratory-confirmed cases of influenza reported in Missouri during the 1996–97 season. Of the 417 confirmed cases, 360 (86%) cases were type A, with 62 subtyped as H3N2. There were 57 (14%) cases of type B influenza reported. Confirmed influenza type A cases peaked during week 52 and influenza type B peaked during week 12. See Figure 1.

There were three laboratory-confirmed outbreaks in long-term care facilities. One was confirmed as type A, sub-typed H3N2, and the other two were confirmed as type A, but not sub-typed.

The influenza season was characterized by several outbreaks of influenza-like illness which were not laboratory-confirmed. The influenza-like illness occurred in the following settings: six outbreaks in long-term care facilities; eight outbreaks in elementary and secondary schools; one outbreak in a university; two community-wide outbreaks; one outbreak in an office setting; and one outbreak in an institution. All of the elementary and secondary school outbreaks occurred prior to the Christmas break.

Influenza-like illness peaked during week 51, one week prior to the confirmed influenza type A peak, and then declined to baseline levels by week 3. There was a small rise of influenza-like illness during week 10 that signaled the rise in confirmed influenza type B, which peaked during week 12. See Figure 2.

Pneumonia and influenza deaths fluctuated around the previous 13-year

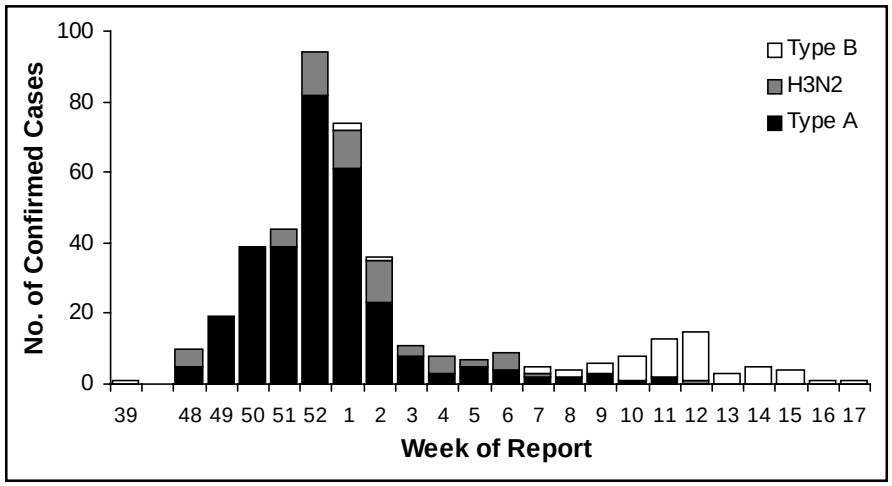


Figure 1. Laboratory-confirmed influenza cases by week of report, Missouri, 1996–97 season.

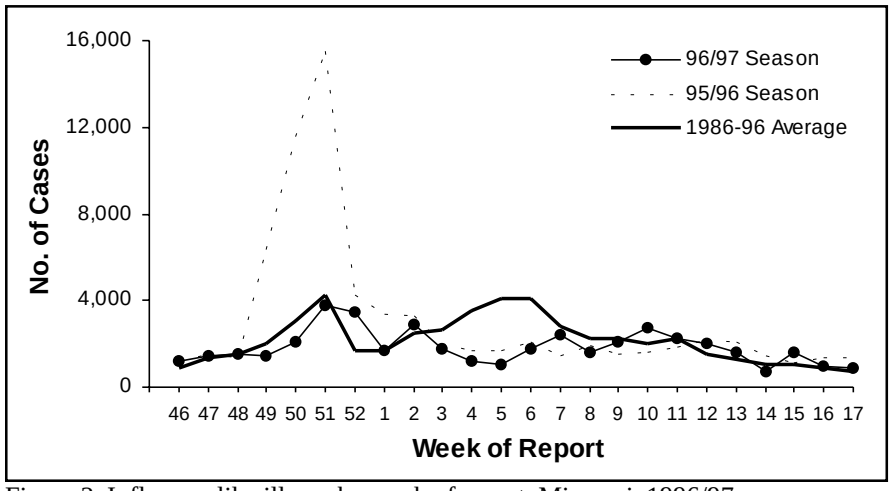


Figure 2. Influenza-like illness by week of report, Missouri, 1996/97 season, 1995/96 season and 1986–96 average.

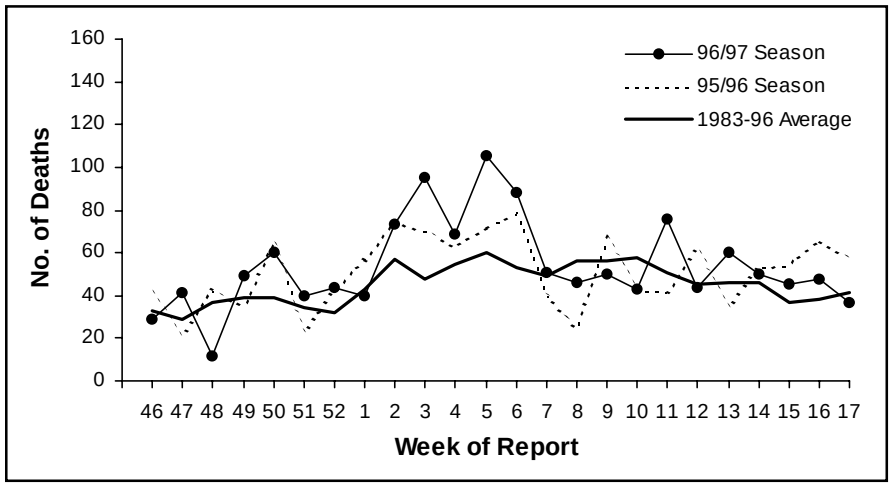


Figure 3. Pneumonia and influenza deaths by week of report, Missouri, 1996/97 season, 1995/96 season and 1983–96 average.

average, with a notable increase observed week 2 through week 7. Peaks above the previous 13-year average occurred in weeks 50, 3, 5 and 11. See Figure 3.

Figure 4 shows laboratory-confirmed influenza cases by county of residence.

1997-98 Influenza Season

The Food and Drug Administration Vaccines and Related Biological Products Advisory Committee has recommended that the 1997-98 trivalent influenza vaccine for the United States include A/Bayern/07/95-like (H1N1), A/Wuhan/359/95-like (H3N2), and B/Beijing/184/93-like hemagglutinin antigens. United States manufacturers will use the antigenically equivalent strains A/Johannesburg/82/96 (H1N1), A/Nanchang/933/95 (H3N2), and B/Harbin/07/94 because of their growth properties.

Recommendations for the use of influenza vaccine for the 1997–98 season can be found on pages 12, 13 and 15.

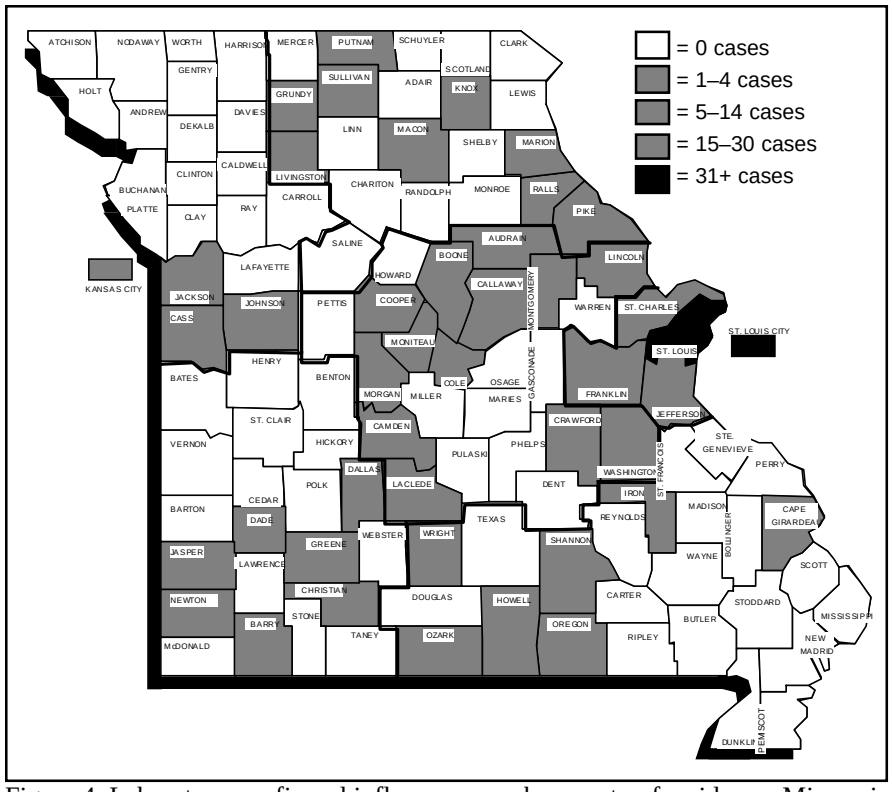


Figure 4. Laboratory-confirmed influenza cases by county of residence, Missouri, 1996–97 season.

Influenza Vaccine

(continued from page 13)
work sites and making vaccine available during night and weekend work shifts can enhance compliance, as can a follow-up campaign early in the course of a community outbreak.

Persons Traveling to Foreign Countries

Persons preparing to travel to the tropics at any time of year or to the Southern Hemisphere from April through September should review their influenza vaccination histories. If they were not vaccinated the previous fall or winter, they should consider influenza vaccination before travel. Persons in high-risk groups should be especially encouraged to receive the most current vaccine. Persons at high risk who received the previous season's vaccine before travel should be revaccinated in the fall or winter with the current vaccine.

VIDEOCONFERENCE

Surveillance of Vaccine-Preventable Diseases

The Centers for Disease Control and Prevention will present the satellite broadcast, "Surveillance of Vaccine-Preventable Diseases," on December 4, 1997 from 11:00 a.m. to 2:30 p.m.

This live 3.5 hour, interactive satellite videoconference will discuss vaccine-preventable disease (VPD) case definitions, clinical descriptions, case classification, laboratory testing, case investigations, reporting procedures and methods for enhancing quality of surveillance for VPDs. The broadcast will feature a question and answer session in which participants nationwide can address questions to the course instructors on toll-free telephone lines. Target audience includes: physicians, nurses, sanitarians, infection control practitioners, laboratorians, epidemiologists, disease reporters and others who are involved in the surveillance and reporting of VPDs.

Continuing education credit will be offered for a variety of professions, based on 3.5 hours of instruction.

For more information about the course or for site locations, contact the immunization representative in your district health office or the Bureau of Immunization at (573) 751-6133.

Tuberculois Infection in Missouri

Lynelle Phillips, R.N., M.P.H.
Bureau of Tuberculosis Control

Tuberculosis infection (TBI) has been a reportable condition in the state of Missouri since 1991. The Bureau of Tuberculosis Control maintains a registry of all reported TBI. Ongoing surveillance of TBI is an essential part of understanding tuberculosis disease transmission and prevention. Without treatment, TBI progresses to disease in 10 percent of those infected. For dually infected HIV/TBI, that percentage increases to 10 percent per year.

TBI is treatable with Isoniazid (INH). A six-month course of INH will virtually eliminate the progression of tuberculosis infection to disease over the lifetime of the patient. Ensuring that patients adhere to preventive therapy regimens is the key to eliminating the development of tuberculosis disease. Although the bureau has been passively tracking completion of therapy for all reported TBI, the database has been incomplete. The bureau has begun actively tracking completion of preventive therapy information on TBI patients reported in 1996.

The TBI database was queried for patients beginning INH treatment between June 1995 and June 1996 and existing data on completion of preventive therapy were compiled. Local health departments were contacted with a list of patients missing completion of therapy information. All health departments responded. Patients who completed preventive therapy were defined as those who had picked up all six monthly prescriptions of INH.

A total of 793 TBI patients should have completed preventive therapy in 1996. Inmates, patients taking INH longer than six months, patients who died, and those patients that discontinued therapy due to adverse reactions were excluded from analysis since all had extenuating circumstances affecting compliance. Although the bureau recommends that all TBI patients receive INH and follow-up care free of charge through their local health department, many patients were unknown to the health department and presumably received their care through a private physician. These patients were excluded since their completion status was unknown. After excluding those patients, 438 remained for analysis. Of the 438, 71.5 percent (n=313) completed therapy. Reasons given for not completing preventive therapy were "moved" (n=35), "lost to follow-up" (n=48) and "other" (n=42). See Figure 1.

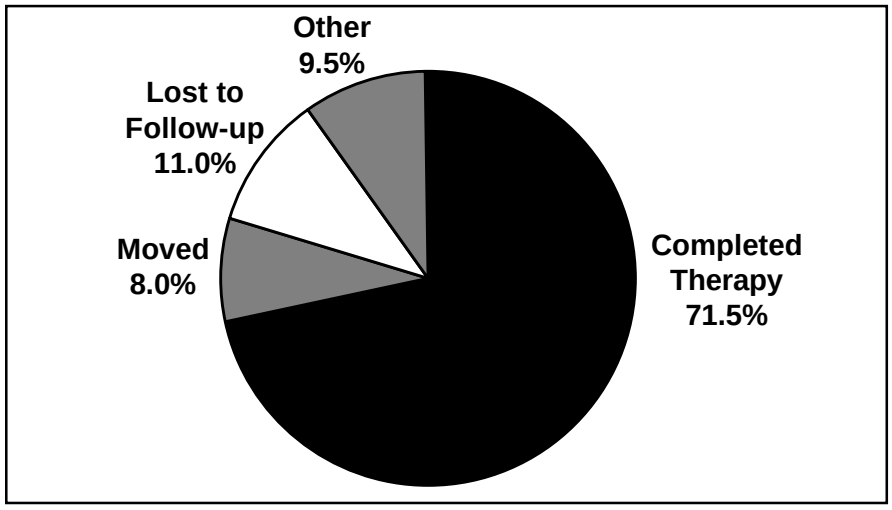


Figure 1. Outcome of preventive therapy in study group of 438 tuberculosis infected patients, Missouri, 1996.

The possibility that certain demographic factors may be associated with completion of therapy was assessed. These factors were age, sex, race, ethnic origin, size of PPD reaction, chest x-ray result and reasons for testing. Reasons given for being testing were contact to a tuberculosis (TB) disease case, employee or resident of long-term care, correctional or health care facility, medical referral, symptoms assessment, substance abuse screening and school requirement. Aside from ethnic origin and being a Department of Corrections (DOC) employee, no factor was associated with increased compliance. This finding is consistent with other research that suggests that compliance cannot be predicted based on the demographic characteristics of the patient.

Two factors were associated with increased compliance. Non-Hispanics were approximately three times more likely to complete therapy than Hispanics ($p < 0.05$). Also, DOC employees were approximately three times more likely to complete therapy ($p < 0.05$). A trend in increased compliance in older TBI patients was noted; however, it did not achieve statistical significance.

Several issues were gleaned from the results of this study. A surprisingly large number of TBI patients had to be excluded from the analysis because they were not followed by the health department. This highlights the challenges involved in coordinating surveillance with the private sector. Emphasis on education of private physicians about involving the local health department in preventive therapy and TBI follow-up may be needed.

Over two-thirds of the patients that began preventive therapy picked up all five refills and presumably completed treatment. Although encouraging, it may

be incorrect to assume that most patients that go to the trouble of picking up refills are, in fact, taking all medication daily. Directly observed preventive therapy (DOPT) is the only way to ensure the patient is taking the medication. DOPT can be implemented by placing the patient on twice weekly therapy (900 mg. INH twice weekly) and arranging for the health department or a responsible member of the community to observe the patient swallowing the pills. DOPT has been gaining increasing popularity, and has been implemented at correctional facilities, schools, health care settings, homeless shelters and in combination with directly observed therapy (DOT) for case contacts.

Hispanics were shown to be less likely to complete preventive therapy. This finding reflects the large number of migrant workers who are PPD positive, but so transient that ensuring completion of a six-month regimen of INH is virtually impossible. CDC has begun efforts to coordinate with Mexico by utilizing a binational TB registry. The Bureau of Tuberculosis Control is currently assessing the possibility of participating in this registry.

DOC staff were found to be more likely to complete preventive therapy. DOC has emphasized TB prevention over the last several years and makes great efforts to raise awareness about TB among staff and inmates. Their report of only one TB disease case last year and none thus far in 1997 attests to the success of their aggressive policies. The finding that DOC employees tend to complete their treatment more often is not surprising.

The data from this study have limitations associated with a new registry including underreporting and incomplete reporting. However, this study did help raise awareness about the TBI registry and reporting of not only TBI, but medication compliance.

If you have any questions about TBI reporting or the contents of this article, feel free to contact the Bureau of Tuberculosis Control at (573) 751-6122.

What is the Difference Between Tuberculosis Infection and Tuberculosis Disease?

Tuberculosis infection means that the person has been exposed to the bacteria that cause tuberculosis. They are not sick because the bacteria are inactive. They cannot spread the bacteria to others. A person with tuberculosis infection usually has a positive skin test, a normal chest x-ray and does not feel sick. An average of one in ten infected persons develop tuberculosis disease at sometime in their lifetime unless given preventive therapy. However, persons who are infected with the tuberculosis bacteria and have HIV infection may not show a reaction to the tuberculosis skin test, and are at considerably greater risk of developing tuberculosis disease. Persons with tuberculosis infection may be given Isoniazid (INH) for six months to prevent tuberculosis disease from developing.

Tuberculosis disease means that the person is sick from bacteria that are actively reproducing in their body. Persons with pulmonary tuberculosis usually have a positive skin test, an abnormal chest x-ray and one or more of the symptoms of tuberculosis such as persistent cough, chest pain, feeling weak, weight loss, fever and/or night sweats. These people are often capable of giving the infection to others. Persons with tuberculosis disease should be treated with four antituberculosis medications to treat the disease.

Reporting Tuberculosis Infection

Cindy Matheis
Bureau of Tuberculosis Control

Tuberculosis infection is a reportable condition in Missouri as required by Missouri Department of Health Regulation 19 CSR 20-20.020, which also requires reporting of tuberculosis disease. The monitoring and follow-up of tuberculosis infection can assist in preventing future cases of tuberculosis and eliminating the disease by 2010.

Tuberculosis infection must be reported within three days of identification. Notification is required from any physician, physician assistant, nurse, health care facility or local health agency that has knowledge of the positive skin test.

The *Tuberculin Testing Record* (TBC-4) or the *Disease Case Report* (CD-1) can be used to report tuberculosis infection. Local health agencies are encouraged to utilize the TBC-4 to gather data regarding risk factors and to document preventive treatment, monthly medication issued, monitoring for side effects and completion of preventive treatment. Some of the essential information that must be provided includes the results of the skin test in millimeters of induration, the results of the chest x-ray, risk factors and medication that the patient is receiving.

The Mantoux method is the standard for all tuberculin tests in Missouri. Multiple puncture (tine) tests are not appropriate for use in the diagnosis of tuberculosis infection or disease and should not be used. If a multiple puncture test was used, the patient should be retested using the Mantoux method, unless the reaction was vesicular.

Reporting forms can be obtained by contacting your local health department or calling the Bureau of Tuberculosis Control at (800) 611-2912 or (573) 751-6122.

HIV/AIDS Care and Prevention Update

Pamela Rice Walker
Division of Environmental Health and Communicable Disease Prevention

Effective May 1, 1997, the Bureau of HIV/AIDS Care was moved from the Division of Maternal, Child and Family Health (DMCFH) to the Division of Environmental Health and Communicable Disease Prevention, and was subsequently renamed the Bureau of HIV/AIDS Care and Prevention Services. The HIV/AIDS Care program was created in DMCFH in 1989.

The Bureau of HIV/AIDS Care and Prevention Services provides comprehensive services in responding to persons with HIV/AIDS by conducting the following activities:

- Coordinates services to HIV/AIDS individuals through a statewide system including community-based organizations, local, district and state health departments.
- Administers Missouri Medicaid AIDS Waiver services to eligible individuals in their home in lieu of in-patient nursing or hospital facility.
- Purchases out-patient medical and psychosocial services for HIV/AIDS eligible individuals.
- Purchases housing, utility, transportation, telephone and other support services using funds such as Ryan White Care Act Title II and Housing Opportunities for Persons with AIDS (HOPWA).
- Purchases HIV/AIDS medications for HIV/AIDS clients, including protease inhibitors.
- Develops resources for referral or purchased services utilizing federal, state and local agencies.

Since 1985, 10,722 cases of HIV infection have been reported in Missouri. Of these, 4,126 have died and 6,494 are living with HIV disease. This is a critical time for our society and for public health. How history views us will in large part depend on our ability to control this devastating disease and the compassion with which we meet the needs of those persons infected. A comprehensive, systematic response is essential. We must expand our knowledge about the impact of all communicable and infectious diseases on persons infected with HIV. We must develop effective interventions and integrate services for HIV/AIDS care and prevention across communities, political jurisdictions, organizational structures, and provider networks. We must manage our limited resources in an accountable, effective and efficient manner. We must use our science, our shared knowledge and our expertise to effect societal change. I welcome the move of the Bureau of HIV/AIDS Care and Prevention Services to this division and will support continuity of care for our clients in service coordination.

Leadership

Effective July 1, Ms. Mary Menges was appointed as Chief of the Bureau of HIV/AIDS Care and Prevention. Ms. Menges comes to the bureau with a rich background in tuberculosis, mental health, HIV and refugee health. Her most recent role was Assistant Bureau Chief in the Bureau of Tuberculosis Control. Ms. Menges played a significant role in the development of Missouri AIDS legislation in 1986. In 1989, she was appointed the AIDS/Tuberculosis Health Coordinator for the Missouri Department of Mental Health, Division of Alcohol and Drug Abuse. She authored the division's first HIV/AIDS policy for drug treatment programs. In recent years, she also managed the Missouri Refugee Health Program, which provides incoming refugees with a health assessment designed to eliminate health related barriers to successful resettlement, while protecting the health of the Missouri population. Additionally, she has eight years of experience working in state and federal financial and personnel systems. She is highly experienced and committed to developing community and statewide partnerships to address the public health needs of all Missourians.

Ms. Menges' overall goal is to assure that the diverse medical, mental health and social service needs of the 6,494 persons living with HIV disease in Missouri are addressed compassionately, effectively and equitably, with a combined system built upon available federal, state and local resources. Specifically, Ms. Menges has committed to the following goals:

- Ensure the financial accountability and viability of all Department of Health (DOH) HIV/AIDS care programs;
- Work with HIV/AIDS care partners to implement an effective HIV/AIDS Care Advisory Committee;
- Establish clear goals, programs and processes for delivery of protease inhibitors;
- Effectively outsource case management services to local HIV/AIDS care providers; and
- Develop an experienced, motivated and effective bureau staff team.

HIV/AIDS Care Services/ Medicaid Waiver Outsourcing

In an effort to streamline case management services for the client, DOH is committed to outsourcing all case management services, including Medicaid Waiver services. This is a complicated process and much remains to be done including: an assessment of client needs, fiscal controls, Division of Medical Services approval for waiver, contract language, an assessment of local capacity, DOH staff reassignment and local consortium input. Ms. Kathleen Simpson, Assistant Bureau Chief, has been assigned the staff lead on case

management and will be working over the next several months to address these issues.

HIV/AIDS Care Service Statewide Advisory Committee

DOH in partnership with those living with HIV, elected officials, sister agencies, local community leaders and service delivery providers, is charged with developing a program to effectively control the spread of HIV and meet the health, mental health and social needs of those living with HIV.

Therefore, DOH is establishing the HIV/AIDS Care Advisory Committee for the purpose of providing a forum to discuss policy and future direction for statewide HIV/AIDS care programs. The advisory committee will advise the Chief of the Bureau of HIV/AIDS Care on care service delivery, access, client needs and policy issues.

Specifically, the HIV/AIDS Care Advisory Committee will:

- Consist of 32 members chosen through a public nominations process, which took place in August 1997. Committee members must meet one or a combination of the following selection criteria:
  - HIV positive or living with AIDS,
  - experience with receiving state social, medical, substance abuse, psychiatric or mental health services associated with HIV infection,
  - experience providing social, medical, substance abuse, psychiatric, correctional or mental health services to persons who are HIV positive or living with AIDS,
  - all successful candidates must be able to participate in quarterly meetings held in central Missouri.
- Consist of one staff member from DOH knowledgeable in HIV/AIDS care issues and one staff member from DOH knowledgeable in sexually transmitted disease (STD)/HIV prevention issues, chosen through the nominations process.
- Be epidemiologically representative and be gender, racially, socially, experientially and geographically diverse.
- Advise the Chief of the Bureau of HIV/AIDS Care on policy and service delivery issues including:
  - access to HIV/AIDS treatment and services,
  - cost of HIV/AIDS treatment and services,
  - early intervention in the course of HIV disease,
  - secondary prevention,
  - unmet client medical, mental health and social needs,
  - education and outreach to care clients.
- Coordinate with the Missouri HIV/STD Prevention Community Planning Groups regarding cooperative issues and maximizing services.
- Be governed by Roberts Rules of Order.
- Meet quarterly in either Jefferson City or Columbia. The first Advisory Committee quarterly meeting is scheduled for October 6–7, 1997 in Jefferson City.
- Be staffed by the Chief of the Bureau of HIV/AIDS Care and other persons she may assign.

Implementation of House Bill 20, Bureau of HIV/AIDS Care and Prevention Services

In May 1997, the Missouri legislature called upon DOH to create an organization that would adequately address the needs of Missourians at risk for and living with HIV. In the effort to fully assess the needs for comprehensive HIV/AIDS prevention and care services, DOH engaged in a series of planning discussions with key community partners during the summer of 1997 to discuss the following:

- Gaps in prevention and care services.
- Necessary linkages between communicable disease, tuberculosis, STD/HIV Prevention and HIV/AIDS Care.
- Identification of the most critical issues facing individuals, communities, providers and public health managers.

Key community partners include:

- Members of regional and statewide STD/HIV Prevention and HIV/AIDS Care community planning processes,
- Persons at risk for and living with HIV/AIDS disease,
- Missouri state departments engaged in HIV/AIDS prevention or care services (Departments of Corrections, Mental Health, Social Services and Elementary and Secondary Education), and
- Leaders of other health planning efforts: Minority Health Alliances, Caring Communities, Community Health Assessment Resource Team (CHART) and Local Health Advisory Committee.

DOH will carefully consider all of the issues and ideas generated by the sessions, provide feedback to partners, further develop programs that will seek to halt the epidemics of sexually transmitted diseases including HIV, assure appropriate care and treatment for Missourians living with HIV/AIDS, and effectively integrate state communicable disease and service delivery programs affecting Missourians living with HIV disease.

Effective July 1, the Bureau of HIV/AIDS Care was renamed the Bureau of HIV/AIDS Care and Prevention Services and began to track funding and spending in accordance with House Bill 20. However, other major integration or policy changes will not be made until after the issues identification process is complete on October 1.

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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

Charge for Metabolic and Genetic Disease Screening

On June 26 the Governor signed House Bill 600 which amended the law that requires all newborns to be screened for metabolic and genetic diseases such as PKU. This amendment authorized the Department of Health to charge a fee for this screening. It also includes language clarifying the parties responsible for the fee and specifying that the fee is recoverable from third parties. As a result, the department will change its fee collection system from a patient-based fee-for-service system to a system in which the specimen collection kits will be sold to health care providers and facilities, including local public health agencies.

Beginning August 28, 1997, specimen collection kits for newborn screening will be sold for $13 per kit (one specimen per kit). Order forms are available from the State Public Health Laboratory, 307 W. McCarty Street, Jefferson City, MO 65101, Ph: (573) 751-3334 or FAX: (573) 751-7219. Payment must accompany the order form.

We realize that there will be specimens in transit on August 28 and providers who do not see newborns on a frequent basis. Consequently, we will continue to accept specimen kits which have not been pre-paid through December 1997 and will bill for these specimens. However, beginning January 1, 1998, all newborn screening specimens must be paid for in advance.

For further information on ordering specimen collection kits, please call the State Public Health Laboratory at (573) 751-3334.

Missouri EPIDEMIOLOGIST

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Infectious Disease Mortality in Missouri—1980 to 1995

Nilsa E. Mack, M.P.H.
H. Denny Donnell, Jr., M.D., M.P.H.
Office of Epidemiology

Wayne F. Schramm, M.A.
Joseph W. Stockbauer, M.A.
Philip Batty, M.A.
Bureau of Health Data Analysis

Mahree Skala, M.A.
Division of Environmental Health and Communicable Disease Prevention

Introduction

The spectrum of infectious diseases is expanding and many infectious diseases once thought to be conquered are increasing.[1] Recent events such as a newly discovered *Hantavirus* pulmonary syndrome, foodborne and waterborne outbreaks caused by *Escherichia coli O157:H7*, *Cyclospora* and *Cryptosporidium*, and the currently growing crisis of antibiotic resistance have demonstrated the emergence and reemergence of infectious diseases. The causes for this resurgence are many and complex and include microbial adaptation and change; changes in human demographics and behavior; changes in the environment; the increases in national and international travel; changes in food handling, shipping and processing; and breakdowns in public health measures for previously controlled infections (e.g, cholera, tuberculosis [TB], pertussis).[1]

In addition, overall deaths due to infectious diseases are increasing. In the United States, the death rate due to infectious diseases as the underlying cause-of-death increased 58 percent from 1980 to 1992.[2] Age-adjusted mortality increased 39 percent during the same period.[2] While acquired immunodeficiency syndrome (HIV/AIDS) accounted for many of these deaths, others involved long-recognized killers such as TB and pneumonia.

To address the challenges of emerging infectious disease threats, the Centers for Disease Control and Prevention (CDC) in partnership with state and local health departments, other federal agencies, academic institutions, health care providers, international and public service organizations, has developed a strategic plan, *Addressing Emerging Infectious Disease Threats: A Prevention Strategy for the United States*.[1] Published in 1994, the plan emphasizes the improvement and expansion of infectious disease surveillance; applied research; prevention and control activities; and also proposes to strengthen the public health laboratory infrastructure.[1] The implementation of this plan would result, among other things, in investigations needed to more accurately monitor trends in infectious disease morbidity and mortality.[2] In this report, we evaluated trends in infectious disease mortality for Missouri residents and compared these results with recent documented national trends that show that infectious disease mortality has been increasing for both the United States and for Missouri.

Methods

The current disease classification system, *International Classification of Diseases, 9th Revision* (ICD-9), does not readily allow assessment of the aggregate burden of infectious diseases.[2] Although ICD-9 contains a set of codes (001–139)[3] labeled as infectious diseases, this grouping leaves out many infectious diseases. The ICD-9 places many infectious diseases in non-infectious categories (such as the classification of endocarditis among cardiovascular diseases and the classification of meningitis and middle ear infections among diseases of the nervous system and sense organs, respectively).[1] Fewer than half of deaths directly attributable to infectious diseases are labeled explicitly as infectious in this classification system.[2] Therefore, to assess more accurately the overall burden of infectious disease mortality for Missouri residents, a recoding scheme developed by CDC classifying ICD-9 codes as infectious diseases, consequence of infectious diseases, or not infectious

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diseases was used. This recoding scheme categorized an additional 377 ICD-9 codes as either infectious diseases or consequences of infections. This recoding scheme was used in the national study and was obtained from the National Technical Information Services (order number PB96-500194).[2]

A total of 1,131 codes that in all cases represent either infectious diseases or consequence of an infectious disease, were applied to the Missouri death files for the years 1980 to 1992 (the years of the national study), focusing on the underlying cause-of-death. To obtain more recent estimates for Missouri, the analysis was extended to the year 1995, the most recent year for which final data were available. The total annual number of deaths of Missouri residents coded to each infectious disease ICD-9 recode as the underlying cause-of-death was calculated and stratified by demographic variables. The crude rates of infectious disease deaths were age-adjusted to United States 1980 population.

Results 1980 to 1992

From 1980 to 1992, infectious diseases were the underlying cause-of-death in 37,867 (5.8%) of the 647,411 total Missouri resident deaths.

For Missouri residents, the age-adjusted death rate due to infectious diseases as the underlying cause-of-death increased approximately 28 percent (from 41.6 to 53.2 deaths per 100,000) between 1980 and 1992. See Figure 1. In comparison, the infectious disease age-adjusted mortality for United States residents increased 39 percent for the same time period.[2] See Figure 1. Deaths due to respiratory tract infections, septicemia and HIV/AIDS account for most of this increase for Missouri and the United States. See Figure 2. In Missouri, between 1980 and 1992, the death rate due to respiratory tract infections increased 19.2 percent, from 31.2 to 37.2 deaths per 100,000. The death rate from septicemia increased 89.8 percent, from 4.2 to 8.0 deaths per 100,000 for the same time period. HIV/AIDS deaths increased from none in 1980 to 8.8 per 100,000 in 1992.

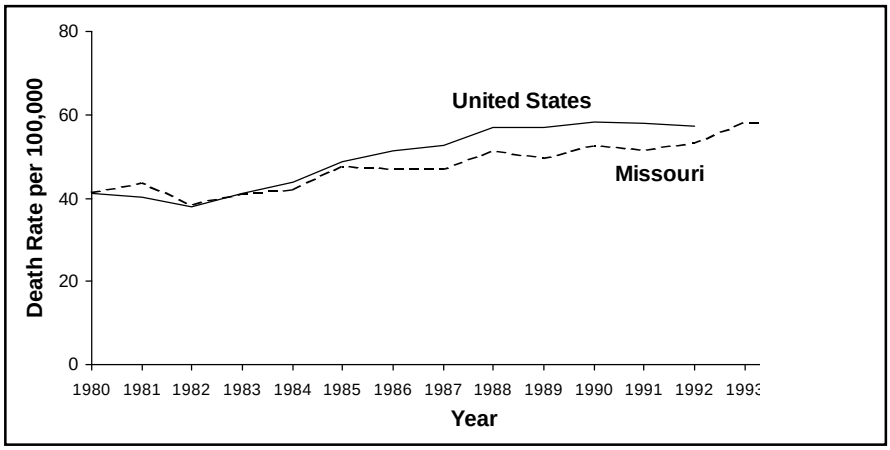

Figure 1. Age-adjusted infectious disease death rates by year, Missouri and United States, 1980–95.

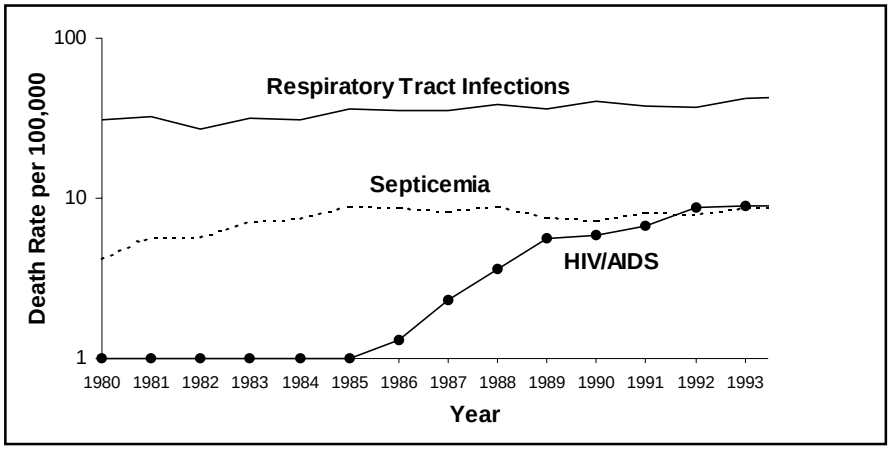

Figure 2. Death rates for selected infectious disease syndromes, Missouri, 1980–95.

From 1980 to 1992, for Missouri and United States residents, there was a decline in the infectious disease death rate among children younger than 5 years.

For Missouri and United States residents, infectious disease mortality was highest among those aged 65 years and older. Between 1980 to 1992, there was a 27 percent increase in the rate of infectious disease deaths (from 289.6 to 368.7 deaths per 100,000) among Missourians ages 65 and over. See Figure 3. For the United States, there was a 25 percent increase in infectious disease death rates for the same time period (from 271 to 338 per deaths 100,000).[2]

The infectious disease death rate is increasing at the fastest rate for ages 25 to 44, for Missouri and the United States, primarily because of HIV/AIDS. Between 1980 to 1992, the rate for this age group increased five fold from 5.6 to 28.3 deaths per 100,000 for Missouri residents. See Figure 3. For the United States, the comparable rate increased from six to 38 deaths per 100,000 for the same time period.[2]

Infectious disease death rates increased in both sexes, from 1980 to 1992, with infectious disease mortality among males higher than among females in practically every age group for Missouri and the United States.

For Missouri residents, the infectious disease death rate in whites increased

about 24.3 percent (from 40.3 to 50.1 deaths per 100,000) from 1980 to 1992. See Figure 4. For African Americans, the infectious disease death rate increased approximately 46.2 percent (from 57.1 to 83.5 deaths per 100,000) for the same time period. See Figure 4. For the United States, the 1992 infectious disease death rate among African Americans was 88 per 100,000; 36 percent higher than for the population as a whole.[2]

Results 1992 to 1995

For Missouri residents, between 1992 and 1995, the age-adjusted death rate due to infectious diseases as the underlying cause-of-death increased an additional 10.3 percent (from 53.2 to 58.7 deaths per 100,000). In 1995, infectious diseases were the underlying cause-of-death for 4,045 (7.5%) of the 54,222 Missouri resident deaths.

From 1992 to 1995, infectious disease death rates among Missouri residents ages 65 and over, increased from 368.7 to 410.5 deaths per 100,000. For ages 25–44, the infectious disease death rate increased an additional 7.4 percent (from 28.3 to 30.4 deaths per 100,000), indicating a slowing of the increase.

During the corresponding time period, the infectious disease death rate among males increased from 70.9 to 75.2 deaths per 100,000. The infectious disease death rate among females increased from 39.1 to 45.2 deaths per 100,000 for this time period.

For the 1992 to 1994 period (the latest year for which rates could be calculated by race), the infectious disease death rate in whites increased from 50.1 to 55.1 deaths per 100,000. For African Americans, the infectious disease death rate increased from 83.5 to 91.6 deaths per 100,000 for the same time period.

Discussion

In summary, the data presented in this report show that infectious disease mortality in Missouri has been increasing since 1980. Missouri findings are similar

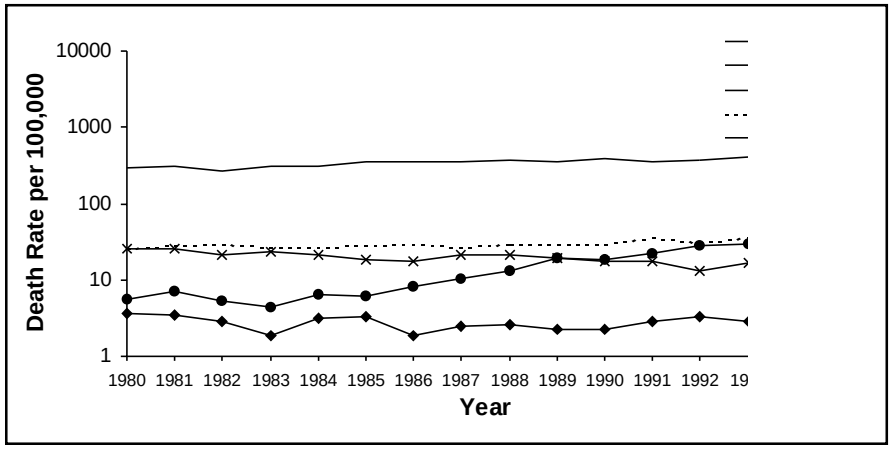

Figure 3. Infectious disease death rates by age group, Missouri, 1980–95.

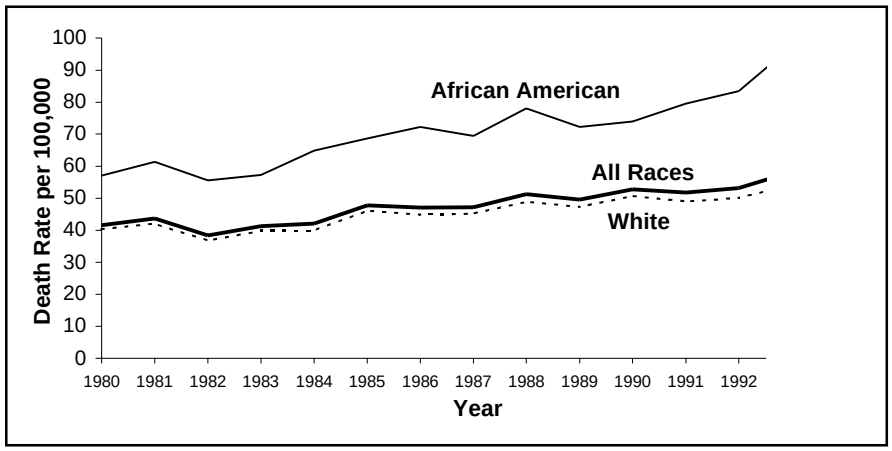

Figure 4. Race-specific age-adjusted infectious disease death rates by year, Missouri, 1980–94.

to national trends for the 1980 to 1992 period. The rate of increase was steepest among people 25–44 years old and largest among the elderly. In Missouri, the upward trend continued for the 1992 to 1995 period.

In Missouri, three causes (pneumonia and influenza, HIV/AIDS, and septicemia) of the top 12 leading causes of death are infectious disease related. In 1980, only pneumonia and influenza ranked in the top 12. During 1995, pneumonia and influenza were the fifth leading cause of death, affecting mainly the elderly. AIDS was the third leading cause of death for Missourians 25–44 years of age in 1995.

Most of the differences in the rate of increase between Missouri and the United States (28 vs. 39 percent) is due to HIV/AIDS. In the United States, when HIV/AIDS deaths listed on the death certificate were subtracted from the total number in which infectious diseases were the underlying cause-of-death, a 22 percent increase remained in the infectious disease death rate between 1980 and 1992.[2] This compares with a 20.1 percent increase in Missouri in the same subset of causes excluding HIV/AIDS.

The findings presented in this report are limited by the validity of the diagnostic information recorded on death certificates.

Infectious diseases increasingly threaten public health and contribute significantly to the escalating costs of health care.[1] Prevention and control of infectious diseases require a variety of public health

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strategies.[2] To reduce the incidence and prevalence of some infectious diseases, the Division of Environmental Health and Communicable Disease Prevention has addressed specific threats, such as HIV/AIDS, TB, sexually transmitted diseases (STD) and vaccine-preventable diseases in its strategic plan. Following are some of the goals included in the plan:

- To create a state-of-the-art disease surveillance system for the early detection of emerging infections, outbreaks and environmental health threats;
- To ensure that all active TB patients are placed on directly observed therapy;
- To increase the number of patients initially treated with four TB medications;
- To increase the number of eligible Missourians who receive all the age-appropriate recommended immunizations;
- To reduce the incidence of vaccine-preventable diseases and support their global eradication;
- To assure that 100 percent of Missourians have access to timely and quality STD/HIV prevention and treatment services;
- To prevent all new STD/HIV infections in the state of Missouri

To accomplish these goals will require collaborations and partnerships with local health departments, federal agencies, public and private laboratories, health care providers and local communities.

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Policy for Perinatal Hepatitis B

The risk of perinatal hepatitis B transmission is very high. Infants born to mothers positive for the hepatitis B surface antigen (HBsAg) have up to a 90 percent chance of acquiring perinatal hepatitis B infections. Of these infants, 85–90 percent will become chronic hepatitis B carriers and more than 25 percent of these chronic carriers will die from cirrhosis and liver cancer. Prenatal screening identifies HBsAg-positive women and allows the immunoprophylaxis of their newborns with hepatitis B immune globulin (HBIG) and hepatitis B (HB) vaccine. This regimen is up to 95 percent effective in preventing the chronic hepatitis B carrier state.

Prenatal Hepatitis B Screening Law

Section 210.030, RSMo requires that all pregnant women be serologically screened for hepatitis B during their first prenatal examination or no later than twenty days after the first examination. HBsAg-positive pregnant women should be reported to the local health authority or the Department of Health within three days of the positive test.

Recommendations

The Department of Health recommends that all pregnant women be serologically screened for HBsAg in accordance with existing Missouri law. Infants born to HBsAg-positive mothers should receive one dose (0.5 ml) of HBIG and the first dose of High-Risk Pediatric HB vaccine within 12 hours of birth and prior to discharge from the hospital. HBIG and HB vaccine can be given concurrently, but must be administered at separate anatomic sites. The second and third doses of High-Risk Pediatric HB vaccine should be administered at ages 1 month and 6 months.

The Bureau of Immunization will provide anti-HBc screening to household/needle-sharing/sexual contacts of HBsAg-positive pregnant women. HBIG and hepatitis B vaccine will be made available to all newborns and, as necessary according to current Centers for Disease Control and Prevention (CDC) guidelines, to all contacts of any HBsAg-positive pregnant woman. The bureau will also provide serologic screening (anti-HBs) at 12 months of age to any newborn of an HBsAg-positive pregnant woman.

For more information, please contact your district immunization representative or the Bureau of Immunization at (573) 751-6133.

Helicobacter pylori

Fact Sheet for Physicians

September 1997

TEAR OUT FOR FUTURE REFERENCE

What is *Helicobacter pylori*?

Helicobacter pylori (*H. pylori*) is a spiral shaped bacterium that is found in the gastric mucus layer or adherent to the epithelial lining of the stomach. *H. pylori* causes more than 90% of duodenal ulcers and more than 80% of gastric ulcers.

Before 1982, when this bacterium was discovered, spicy food, acid, stress and life-style were considered the major causes of ulcers. The majority of patients were given long-term maintenance doses of acid-reducing medications, such as H_2 blockers, without a chance for permanent cure. Since we now know that most ulcers are caused by *H. pylori*, appropriate antibiotic regimens can successfully eradicate the infection in most patients, with complete resolution of mucosal inflammation and a minimal chance for recurrence of ulcers.

How common is *H. pylori* infection?

Approximately two-thirds of the world's population is infected with *H. pylori*. In the United States, *H. pylori* is more prevalent among older adults, African Americans, Hispanics and lower socio-economic groups.

What illnesses does *H. pylori* cause?

Most persons who are infected with *H. pylori* never suffer any symptoms related to the infection; however, *H. pylori* causes chronic active, chronic persistent and atrophic gastritis in adults and children. Infection with *H. pylori* also causes duodenal and gastric ulcers.

Infected persons have a 2- to 6-fold increased risk of developing gastric cancer and mucosal-associated-lymphoid-type (MALT) lymphoma compared with their uninfected counterparts. The role of *H. pylori* in non-ulcer dyspepsia remains unclear.

What are the symptoms of ulcers?

Approximately 25 million Americans suffer from peptic ulcer disease. Each year there are 500,000 to 850,000 new cases of peptic ulcer disease and more than one million ulcer-related hospitalizations.

The most common ulcer symptom is gnawing or burning pain in the epigastrium. This pain typically occurs when the stomach is empty, between meals and in the early morning hours, but it can also occur at other times. It may last from minutes to hours and may be relieved by eating or taking antacids.

Less common ulcer symptoms include nausea, vomiting and loss of appetite. Bleeding can also occur; prolonged bleeding may cause anemia leading to weakness and fatigue. If bleeding is heavy, hematemesis, hematochezia or melena may occur.

Who should be tested and treated for *H. pylori*?

Persons with active gastric or duodenal ulcers or documented history of ulcers should be tested for *H. pylori*, and if found to be infected, they should be treated. To date, there has been no conclusive evidence that treatment of *H. pylori* infection in patients with non-ulcer dyspepsia is warranted.

Testing for and treatment of *H. pylori* infection are recommended following resection of early gastric cancer and for low-grade gastric MALT lymphoma. Retesting after treatment may be prudent for patients with bleeding or otherwise complicated peptic ulcer disease.

Treatment recommendations for children have not been formalized. Pediatric patients who require extensive diagnostic work-up for abdominal symptoms should be evaluated by a specialist.

How is *H. pylori* infection diagnosed?

Several methods may be used to diagnose *H. pylori* infection. Serological tests that measure specific *H. pylori* IgG antibodies can determine if a person has been infected. The sensitivity and specificity of these assays range from 80–95% depending upon the assay used.

Another diagnostic method is the breath test. In this test, the patient is given either ^{13}C or ^{14}C-labeled urea to drink. *H. pylori* metabolizes the urea rapidly, and the labeled carbon is absorbed. This labeled carbon can then be measured as CO_2 in the patient's expired breath to determine whether *H. pylori* is present.

Upper esophagogastroduodenal endoscopy is considered the reference method of diagnosis. During endoscopy, biopsy specimens of the stomach and duodenum are obtained and the diagnosis of *H. pylori* can be made by several methods:

- The biopsy urease test is a colorimetric test based on the ability of *H. pylori* to produce urease; it provides rapid testing at the time of biopsy.
- Histologic identification of organisms is considered the gold standard of diagnostic tests.
- Culture of biopsy specimens for *H. pylori* requires an experienced laboratory and is necessary when antimicrobial susceptibility testing is desired.

What are the treatment regimens used for *H. pylori* eradication?

Therapy for *H. pylori* infection consists of 1–2 weeks of one or two effective antibiotics, such as amoxicillin, tetracycline (not to be used for children <12 years), metronidazole or clarithromycin, plus either ranitidine bismuth citrate, bismuth subsalicylate or a proton pump inhibitor.

Eradication rates ranges from 70–90% depending on the regimen used. Currently, five *H. pylori* treatment regimens are approved by the Food and Drug Administration (FDA); however, several other combinations have been used successfully. See Table 1. Antibiotic resistance and patient noncompliance are the two major reasons for treatment failure.

Table 1. FDA-Approved Treatment Options for *H. pylori*

1. Omeprazole 40 mg QD + Clarithromycin 500 mg TID x 2 weeks, then Omeprazole 20 mg QD x 2 weeks

- OR -

2. Ranitidine bismuth citrate (RBC) 400 mg BID + Clarithromycin 500 mg TID x 2 weeks then RBC 400 mg BID x 2 weeks

- OR -

3. Bismuth subsalicylate (Pepto Bismal®) 525 mg QID + Metronidazole 250 mg QID + Tetracycline 500 mg QID* x 2 weeks + H_2 receptor antagonist therapy as directed x 4 weeks

- OR -

4. Lansoprazole 30 mg BID + Amoxicillin 1 g BID + Clarithromycin 500 mg BID x 14 days

- OR -

5. Lansoprazole 30 mg TID + Amoxicillin 1 g TID x 14 days**

* Although not FDA approved, amoxicillin has been substituted for tetracycline for patients in whom tetracycline is not recommended.

** This dual therapy regimen has restrictive labeling. It is indicated for patients who are either allergic or intolerant to clarithromycin or for infections with known or suspected resistance to clarithromycin.

Are there any long-term consequences of *H. pylori* infection?

Recent studies have shown an association between long-term infection with *H. pylori* and the development of gastric cancer. Gastric cancer is the second most common cancer worldwide; it is most common in countries such as Colombia and China, where *H. pylori* infects over half the population in early childhood. In the United States, where *H. pylori* is less common in young people, gastric cancer rates have decreased since the 1930s.

How do people get infected with *H. pylori*?

It is not known how *H. pylori* is transmitted or why some patients become symptomatic while others do not. The bacteria are most likely spread from person to person through fecal-oral or oral-oral routes. Possible environmental reservoirs include contaminated water sources. Iatrogenic spread through contaminated endoscopes has been documented but can be prevented by proper cleaning of equipment.

What can people do to prevent *H. pylori* infection?

Since the source of *H. pylori* is not yet known, recommendations for avoiding infection have not been made. In general, it is always wise for persons to wash hands thoroughly, to eat food that has been properly prepared and to drink water from a safe, clean source.

What is the Centers for Disease Control and Prevention (CDC) doing to prevent this infection?

CDC, in conjunction with partners in other government agencies, academic institutions and industry, is conducting a national education campaign to inform health care providers and consumers of the link between *H. pylori* and stomach and duodenal ulcers. CDC is also working with partners to study routes of transmission and possible prevention measures, and to establish an antimicrobial resistance surveillance system to monitor the changes in resistance among *H. pylori* strains in the United States.

How can I get more information about *H. pylori*?

1. NIH Consensus Development Conference. *Helicobacter pylori* in peptic ulcer disease. JAMA 1994;272:65–69.
2. Soll, AH. Medical treatment of peptic ulcer disease. Practice guidelines. [Review]. JAMA 1996;275:622–29 [published erratum appears in JAMA 1996 May 1;275:1314].
3. Hunt, RN. *Helicobacter pylori*: from theory to practice. Proceedings of a symposium. Am J Med 1996;100(5A) supplement.
4. The American Gastrointestinal Association, American Digestive Health Foundation, 7910 Woodmont Avenue, 7th floor, Bethesda, MD 20814, Ph: (301) 654-2055, FAX: (301) 654-5920.
5. The National Digestive Diseases Information Clearinghouse, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, 2 Information Way, Bethesda, MD 20892-3570, Ph: (301) 654-3810.

For further information, contact the Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, 1600 Clifton Road, MS:CO9, Atlanta, GA 30333.

CDC also has established an *H. pylori* information line for physicians and patients. The toll-free number is

1-888-MY ULCER.

Guide to Public Health Information on the World Wide Web

Consumer Health Information

Aging

http://www.nih.gov/nia

Information from the National Institute on Aging (NIA) regarding a wide range of topics, from specific diseases or health conditions to treatments and research. In addition, specific information from NIA about Alzheimers Disease is available (http://www.cais.com/adear). Information about aging services and care is available from HHS' Administration on Aging (http://www.aoa.dhhs.gov/elderpage.html), and information about Medicare is available from HHS' Health Care Financing Administration (http://www.hcfa. gov).

Cancer

http://cancernet.nci.nih.gov

Provides up-to-date, accurate medical information on cancer. Also contains a directory of genetic counselors, physicians, geneticists and nurses who have expertise in counseling about familial risk and genetic testing for cancer. More cancer information is also available from the National Cancer Institute (http://rex.nci.nih.gov).

Cryptosporidiosis

http://www.cdc.gov/ncidod/diseases/crypto/crypto.htm

This site includes documents designed for the public, HIV-positive individuals, health care providers and public health and water utility officers.

Healthfinder

http://www.healthfinder.gov

A gateway site to help consumers find health and human services information quickly. Healthfinder includes links to more than 1,250 Web sites, including more than 250 federal sites and 1,000 state, local, not-for-profit, university and other consumer health resources. Topics are organized in a subject index.

Immunization

http://www.cdc.gov/nip

Answers frequently-asked questions about childhood immunization, including current recommendations on what immunizations children need and when.

International Travel and Health

http://jupiter.who.ch/programmes/emc/yellowbook/yb_home.htm

The 1997 edition of International Travel and Health–Vaccination Requirements and Health Advice is now accessible as hypertext files in English, Spanish and Japanese.

Mammography

http://www.fda.gov/cdrh/faclist.html

Listing of facilities providing mammography which are certified by the Food and Drug Administration as meeting baseline quality standards. The list is searchable by area or zip code.

Medline

http://www.nlm.nih.gov

The world's most extensive collection of published medical information, coordinated by the National Library of Medicine. Originally designed primarily for health professionals and researchers, MEDLINE is also valuable for students and for those seeking more specific information about health conditions, research and treatment. Free access to MEDLINE was initiated on June 26, 1997. "PubMed," a free on-line service, will provide direct Web links between MEDLINE abstracts and the publishers of full-text articles.

National Institutes of Health Health Information Page

http://www.nih.gov/health

Provides a single access point to the consumer health information resources of the National Institutes of Health (NIH), including the NIH Health Information Index, NIH publications and clearinghouses and the Combined Health Information Database.

Substance Abuse

http://www.health.org

This site provides information about substance abuse treatment and prevention. Background on research is available from the National Institute on Drug Abuse (http://www.nida.nih.gov) and the National Institute on Alcohol Abuse and Alcoholism (http://www.niaaa.nih.gov).

Travelers Information

http://www.cdc.gov/travel

Provides current CDC information regarding important vaccine requirements and recommendations, malaria risk and drug information, food and water precautions, outbreak information and other prevention practices for travelers. Includes links to CDC's Vessel Sanitation Program for sanitation inspections on international cruise ships.

Treatment Findings

http://www.ahcpr.gov

Department of Health and Human Services (HHS) Agency for Health Care Policy and Research provides data to help consumers make informed health care decisions about specific health conditions, prescriptions and other treatment issues. The site offers research results on what has been found to work best.

Public Health Resources

Guide to Clinical Preventive Services, Second Edition

http://odphp.osophs.dhhs.gov/pubs/guidecps

This publication reviews the scientific evidence behind various clinical preventive services, summarizes current recommendations of leading groups and provides current recommendations from the U.S. Preventive Services Task Force, an independent expert advisory panel to the U.S. Public Health Service. Printed copies are available from the Superintendent of Documents, U.S. Government Printing Office at (202) 512-1800, cost $35.00.

HIV/AIDS Prevention Home Page

http://www.cdc.gov/nchstp/hiv_aids/dhap.htm

CDC's site for HIV and AIDS information. Other sources are AIDS Education Global Information System (ÆGIS) at http://www.aegis.com and HIV Insite at http://hivinsite.ucsf.edu.

Hospital Infections Program

http://www.cdc.gov/ncidod/hip/hip.htm

CDC's Hospital Infections Program (HIP) is dedicated to assisting the Pulbic Health Service, state and local health departments, hospitals and professional organizations worldwide in the prevention and control of nosocomial infections.

Morbidity & Mortality Weekly Report

http://www.cdc.gov/epo/mmwr/mmwr.html

This weekly CDC publication reports on such public health topics as emerging infectious diseases, immunizations, environmental health, chronic disease issues, etc. You can subscribe to receive this publication electronically each week.

Prevention Guidelines Database

http://www.cdc.gov/diseases/diseases.html#prev

This is a compendium of all official guidelines and recommendations published by CDC for the prevention of diseases, injuries and disabilities. It contains more than 400 control and prevention documents on a wide range of topics including AIDS, vaccine-preventable diseases, TB, sexually transmitted diseases, surveillance, emergency preparedness, suicide, diabetes, birth defects and physical activity.

STD Prevention Home Page

http://www.cdc.gov/nchstp/dstd/dstdp.html

CDC's site for information on sexually transmitted diseases. Other sources are the American Social Health Association at http://sunsite.unc.edu/ASHA and St Louis STD/HIV Prevention Training Center at http://www.umsl.edu/services/itc/std_ptc.html.

Tracking Emerging Diseases Worldwide:ProMED
http://www.fas.org/promed
ProMED is a project of the Federation of American Scientists to promote the establishment of a global Program for Monitoring Emerging Diseases. This communication system on Internet includes worldwide information on outbreaks of diseases of animals and plants as well as human illness. This site includes a digest of current information on worldwide disease surveillance, current outbreak reports from WHO, global disease trends, emerging animal diseases and diseases of plants of agricultural interest. Several links to related sites are also offered. Users may also be able to subscribe to regular ProMED mail.

Weekly Epidemiological Record
http://www.who.ch/wer/wer_home.htm
This publication serves as an essential instrument for the rapid and accurate dissemination of epidemiological information on cases and outbreaks of diseases under the International Health Regulations, other communicable diseases of public health importance, including the newly emerging or re-emerging infections, non-communicable diseases and other health problems.

Federal Sites

Administration on Aging
http://www.aoa.dhhs.gov
Administration for Children and Families
http://www.acf.dhhs.gov
Agency for Health Care Policy and Research
http://www.ahcpr.gov
CDC Travel Information
http://www.cdc.gov/travel
Centers for Disease Control and Prevention (CDC)
http://www.cdc.gov
Department of Health and Human Services (HHS)
http://www.hhs.gov
Environmental Protection Agency
http://www.epa.gov
Emerging Infectious Diseases (EID)
http://www.cdc.gov/ncidod/EID
FedWorld Information Network
http://www.fedworld.gov
Food and Drug Administration
http://www.fda.gov
Health Care Financing Administration (HCFA) (Medicare and Medicaid Agency)
http:/www.hcfa.gov
Health Resources and Services Administration (HRSA)
http://www.hrsa.dhhs.gov
Indian Health Service (IHS)
http://www.ihs.gov
National Cancer Institute
http://rex.nci.nih.gov
National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)
http://www.cdc.gov/nccdphp
National Center of Health Statistics
http://www.cdc.gov/nchswww/nchshome. htm
National Electronic Telecommunications System for Surveillance (NETSS)
http://www. cdc. gov/epo/mmwr/other/netss/netss. html
National Immunization Program
http://www.cdc.gov/nip
National Institute of Allergy and Infectious Diseases
http://www.niaid.hih.gov
National Institute on Aging
http://www.nih.gov/nia
National Institute on Alcohol Abuse and Alcoholism
http://www.niaaa.nih.gov
National Institute on Drug Abuse
http://www.nida.nih.gov
National Institutes of Health (NIH)
http://www.nih.gov
National Network of Libraries of Medicine
http://www.nnlm.nlm.nih.gov
Substance Abuse and Mental Health Administration (SAMHSA)
http://www.health.org
U.S. National Library of Medicine (NLM)
http://www.nlm.nih.gov
U.S. Public Health Service
http://www.dhhs.gov/phs

Nonprofit Organization Sites

American Cancer Association
http://www.cancer.org
American College of Obstetricians and Gynecologists
http://www.acog.com
American Lung Association
http://www.lungusa.org
American Medical Association
http://www.ama-assn.org
American Medical Informatics Association
http://amia.org
American Public Health Association (APHA)
http://www.apha.org
American Veterinary Medical Association (AVMA)
http://www.avma.org
Joint Commission of Accreditation of Healthcare Organizations
http ://www.jcaho.org
Missouri State Medical Association
http://www.msma.org
Outbreak
http://www.outbreak.org/cgi-unreg/dynaserve.exe/index.html
PLL ONLINE—the WHO Library and Health Literature Services
http://www-pll.who.ch/programmes/pll/hlt/hlt_index.html
Telemedicine Information Exchange
http://tie.telemed.org/TIEmap.html

Private Organization Sites

Annual Review of Public Health
http://www.AnnualReviews.org/ari
Medscape: (CME credit available)
http://www5.medscape.com
Physicians' Choice
http://www.mdchoice.com
Physicians' Online Network
http://www.po.com/welcome.html

State Sites

Missouri Department of Health
http://www.health.state.mo.us
Missouri Department of Social Services
http://www.state.mo.us/dss

University and College Sites

Kirksville College of Osteopathic Medicine
http://www.kcom.edu
St. Louis University
http://www.slu.edu
University of Missouri-Columbia
http://www.missouri.edu
University of Missouri-Kansas City
http://www.umkc.edu
University of Health Sciences College of Osteopathic Medicine
http://www.uhs.edu
Washington University
http://www.wustl.edu

Portions reprinted with permission from *West Virginia Epi-Log*, *Indiana Epidemiology Newsletter* and *Texas Disease Prevention News* (prepared by John Vindehlde, MD, MPH, MBA, Medical Manager, Houston Department of Health and Human Services).

Missouri Osteoporosis Prevention and Education Program (MOPEP)

Virginia Beatty
Bureau of Chronic Disease Control

The Missouri legislature appropriated $80,260 in general revenue funds, including two staff positions, to the Missouri Department of Health's FY97 budget to support the 1995 legislated osteoporosis program (192.640, RSMo). This legislation gave the department the ability to establish and maintain an osteoporosis prevention and education program. The program is designed to promote public awareness regarding the causes of osteoporosis, options for prevention and the value of early detection and possible treatments, including the benefits and risks of those treatments.

The osteoporosis program is located within the Bureau of Chronic Disease Control, Division of Chronic Disease Prevention and Health Promotion. Staff were hired in December 1996. A coalition consisting of physicians, health administrators, nutritionists, nurses, educators and lay persons from across the state of Missouri was established to assist in the planning, development and implementation of education and outreach activities.

The program's mission is to implement and maintain an education program to increase awareness and improve prevention activities among Missourians. Program staff collaborate with the Missouri Arthritis Program; health care professionals; community, state and national organizations; and local health agencies to establish and implement strategies. To achieve the mission, program staff utilize strategic planning and evaluation, and have identified several goals which are to:

- increase prevention and education activities;
- identify and disseminate educational resources;
- promote and/or facilitate professional education programs; and
- define the burden of osteoporosis in Missouri.

Missouri residents can call (800) 316-0935 to obtain information regarding local service locations and to obtain educational materials. Recorded messages are taken 24 hours a day, seven days a week.

For additional information about this program, contact Virginia Beatty, Program Manager at (573) 876-3207 or beattv@mail.health. state.mo.us.

Osteoporosis Facts

National Data

- Twenty-five million Americans, of which 20 million are women, have or are at risk for osteoporosis.
- Estimates show that nearly 40 percent of postmenopausal women, after age 50, will suffer an osteoporotic fracture during their remaining lifetime.
- Osteoporosis is responsible for approximately 1.3 million broken bones each year in the United States.
- Osteoporosis costs Americans $10 billion a year.

Missouri Data

- Between 1995 and 2015, 112,000 Missouri women, age 45 and over, are expected to suffer hip fractures.
- The annual cost to Missouri's health care system from fractures will rise from $119 million in 1995 to $399 million in 2015.

Source: National Osteoporosis Foundation, Burden of Fractures Model

Prevention of Cold-Related Illness

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. During the past ten winters, 135 Missourians died from cold-related illness. A little over half of these individuals were age 65 and over. During the winter of 1996–97, 14 deaths due to cold-related causes were reported; seven of those deaths were in individuals age 65 and over.

An individual gains body heat from food and muscular work, and loses it through convection, conduction, radiation and sweating to maintain a constant body temperature of approximately 98.6°F. The body's first response to a cold environment is constriction of the blood vessels of the skin; that reduces heat loss from the surface of the skin by decreasing peripheral blood flow; and/or shivering, that generates heat by increasing the body's metabolic rate.

Older adults often make less body heat because of a slower metabolism and less physical activity. They are often homebound and bedfast, and have less perception of the cold. Frequently, they are trying to reduce expenditures on heating and may gradually get so cold that their body temperature falls below a critical level, and even at temperatures well above the freezing mark, persons may die of hypothermia. If you are more than 65 years of age, check the temperature in your home often, especially during severely cold weather. All Missourians should check on elderly friends and neighbors frequently to ensure that their homes are adequately heated.

Infants less than one year old should never sleep in a cold room because infants lose body heat more easily than adults; and unlike adults, infants are not able to make additional body heat by shivering. Provide warm clothing and a blanket for infants and try to maintain a warm indoor temperature. If the temperature cannot be maintained, make temporary arrangements to stay elsewhere. In an emergency, you can keep an infant warm using your own body heat. If you must sleep, take precautions to prevent rolling on the baby. Pillows and other soft bedding can also present a risk of smothering; remove them from the area near the infant.

Exposure to cold temperatures, whether indoors or outdoors, can cause serious or life-threatening health problems. The most common cold-related problems are hypothermia and frostbite.

Hypothermia

When exposed to cold temperatures, your body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it.

Hypothermia is most likely to occur at very cold temperatures, but can occur even at cool temperatures (above 40°F) if a person becomes chilled from rain, sweat or submersion in cold water.

Victims of hypothermia are most often:

- elderly people with inadequate food, clothing, or heating;
- babies sleeping in cold bedrooms;
- people who remain outdoors for long periods–the homeless, hikers, hunters, etc.

Warnings signs of hypothermia:

Adults	Infants
shivering	bright red, cold skin
confusion	very low energy
memory loss	
drowsiness	
exhaustion	
fumbling hands	
slurred speech	

What to Do

If you notice any of these signs, take the person's temperature. If it is below 95°F, the situation is an emergency–get medical attention immediately.

If medical care is not available immediately, begin warming the person, as follows:

- Get the victim into a warm room or shelter.
- If the victim has on any wet clothing, remove it.
- Warm the center of the body first—chest, neck, head, and groin—using an electric blanket, if available. Or use skin-to-skin contact under loose, dry layers of blankets, clothing, towels or sheets.
- Warm beverages can help increase the body temperature, but do not give alcoholic beverages. Do not try to give beverages to an unconscious person.
- After body temperature has increased, keep the person dry and wrapped in a warm blanket, including the head and neck.
- Get medical attention as soon as possible.

A person with severe hypothermia may be unconscious and may not seem to have a pulse or to be breathing. In this case, handle the victim gently, and get emergency assistance immediately. Even if the victim appears dead, CPR should be provided. CPR should continue while the victim is being warmed, until the victim responds or medical aid becomes available. In some cases, hypothermia victims who appear to be dead have been successfully resuscitated.

Frostbite

Frostbite is an injury to the body that is caused by actual freezing of skin and sometimes underlying body tissues. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose, ears, cheeks, chin, fingers

or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures.

Recognizing Frostbite

At the first signs of redness or pain in any skin area, get out of the cold or protect any exposed skin—frostbite may be beginning. Any of the following signs may indicate frostbite:

- discoloration of the skin
- skin that feels unusually firm or waxy
- numbness

A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb.

What to Do

If you detect symptoms of frostbite, seek medical care. Because frostbite and hypothermia both result from exposure, first determine whether the victim also shows signs of hypothermia, as described previously. Hypothermia is a more serious medical condition and requires emergency medical assistance.

If there is frostbite but no sign of hypothermia and immediate medical care is not available, proceed as follows:

- Get into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on frostbitten feet or toes—to do so increases the damage.
- Immerse the affected area in warm—not hot—water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Or, warm the affected area using body heat. For example, the heat of an armpit can be used to warm frostbitten fingers.
- Do not rub the frostbitten area with snow or massage it at all—to do so will cause more damage.
- Don't use a heating pad, heat lamp or the heat of a stove, fireplace or radiator for warming. Affected areas are numb and can be easily burned.

These procedures are not substitutes for proper medical care. Hypothermia is a medical emergency and frostbite should be evaluated by a health care provider. It is a good idea to take a first aid and emergency resuscitation (CPR) course to prepare for cold-weather health problems. Knowing what to do is an important part of protecting your health and the health of others.

Major Risk Factors for Cold-Related Illness

In addition to the cold environment, other major risk factors contributing to cold-related illness include:

- Inadequate clothing or wet clothing (the actual effects of cold on the body depend on how well the skin is insulated from the environment);
- Drug use or certain medications may inhibit the body's response to cold or impair judgment (examples include beta blocks, neuroleptic drugs, alcohol and cigarettes);
- Diseases or conditions that limit activity, reduce awareness or reduce the normal flow of blood, such as a cold, diabetes, atherosclerosis, hypothyroidism, stroke, severe arthritis, Parkinson's disease or memory disorders, may increase risk;
- Gender: male death rates due to cold exposure are greater than the rates for females; perhaps because of inherent risk-taking activities, body fat composition, or other physiological differences;
- Susceptibility increases with age;
- Exhaustion or immobilization, especially through injury or entrapment.

Environmental Conditions

Environmental conditions that cause cold-related stresses are low temperature, cool high winds, dampness, and cold water. Wind chill (temperature and wind velocity) is an important factor to evaluate when working outside. For example, when the actual air temperature of the wind is 40°F and its velocity is 35 mph, the exposed skin would perceive these conditions as if the equivalent still air temperature were 11°F. A dangerous situation of rapid heat loss may arise for any individual exposed to high winds and cold temperatures.

Eat and Drink Wisely

Eating well-balanced meals will help you stay warmer. Do not drink alcoholic beverages—they cause your body to lose heat more rapidly. Instead, drink warm, sweet beverages such as hot chocolate or sweetened coffee or tea to help maintain your body temperature. If you have any dietary restrictions, ask your doctor.

Avoid Exertion

Cold weather puts an extra strain on the heart. If you have heart disease or high blood pressure, follow your doctor's advice about shoveling snow or performing other hard work in the cold. Otherwise, if you have to do heavy outdoor chores, dress warmly and work slowly. Remember, your body is already working hard just to stay warm, so don't overdo it.

Taking preventive action is the best defense against having to deal with extreme cold-weather conditions. By observing safety precautions during times of extremely cold weather, the risk of cold-related health problems will be reduced.

Additional information on cold-related illness can be found on the Department of Health homepage at http://www.health.state.mo.us/cgi-bin/uncgi/PreventionandWellness.

SOURCES:

Extreme Heat/Extreme Cold A Prevention Guide to Promote Your Personal Health and Safety, Centers for Disease Control and Prevention, 1996.

Preventing Cold-Related Illnesses in Agricultural Workers, Rutgers Cooperative Extension, Rutgers, the State University of New Jersey, 1993.

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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

LATE BREAKERS

☞ In the United States, up to 25 million people have peptic ulcer disease resulting in substantial morbidity and costs. Despite extensive scientific data linking peptic ulcer disease to *Helicobacter pylori*, studies indicate that many health care providers and consumers are still not aware of the relationship. Many people with ulcers have not yet received appropriate therapy. The Centers for Disease Control and Prevention has planned a *H. pylori* and peptic ulcer disease education campaign that was launched during National Infection Control Week, October 19–25, 1997. As part of that effort, we have reprinted CDC's *H. pylori* Fact Sheet for Physicians on pages 5–6 of this issue.

☞ The Missouri Department of Health in cooperation with the Missouri State Emergency Management Agency (SEMA) has been selected to conduct a limited pilot testing of the pandemic influenza control planning guide developed by a steering group for the Centers for Disease Control and Prevention (CDC)/Council of State and Territorial Epidemiologists (CSTE) project "Development of Guidelines and Model State Plans for Influenza Pandemic Preparedness." A design team consisting of professionals from a variety of agencies and disciplines will plan the test pilot to be called FLUEX'98. FLUEX'98 will be a two-day orientation and tabletop exercise held at the State Emergency Operations Center in February 1998. For more information on this exercise, contact Georgia Storm in the Bureau of Immunization at (573) 751-6133.

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Healthy Child Care Missouri

Joy Oesterly
Bureau of Nutrition and Child Care Programs

Every day, approximately 268,500 infants, toddlers and preschool children (about 60%) spend part or most of their day in some type of child care setting in Missouri. Because child care plays such a major role in a child's life, it is critical to ensure that child care and early childhood programs provide high quality experiences for children.

With the national focus on brain research and its impact on early child development, medical professionals, child care professionals and parents are taking a second look at the quality of child care and the interaction between caregivers and children. Child care is a valuable point of access to assuring the healthy development of children.

To reinforce existing efforts to cultivate healthy and safe child care environments and to stimulate new efforts, the Bureaus of Child Care and Maternal and Child Health in the U.S. Department of Health and Human Services have joined together to launch the Healthy Child Care America Campaign. A Blueprint for Action was developed to encourage implementation of ten action steps designed to achieve safe and healthy child care environments.

The ten action steps are not prioritized. Each step is as important as the next and implementing only part of the steps can still improve child care for children. The ten action steps are:

Step 1: Promote safe, healthy and developmentally appropriate environments for all children in child care.

Step 2: Increase immunization rates and preventive services for children in child care settings.

Step 3: Assist families in accessing key public and private health and social service programs.

Step 4: Promote and increase comprehensive access to health screenings.

Step 5: Conduct health and safety education and promotion programs for children, families and child care providers.

Step 6: Strengthen and improve nutrition services in child care.

Step 7: Provide training and ongoing consultation to child care providers and families in the areas of social and emotional health.

Step 8: Expand and provide ongoing support to child care providers and families caring for children with special health needs.

Step 9: Use child care health consultants to help develop and maintain healthy child care.

Step 10: Assess and promote the health, training and work environment of child care providers.

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(continued from page 1)

To complement and partner with the national Healthy Child Care America Campaign, the Missouri Department of Health is promoting the *Healthy Child Care Missouri* program (also known as the Child Care Nurse Consultation Program), which emphasizes the role of the health consultant in child care. *Healthy Child Care Missouri* recognizes the child care environment as a focal point to integrate health care, child care and social support services from programs serving young children and families. *Healthy Child Care Missouri* supports collaborative, statewide and community-based efforts to ensure safe, healthy and developmentally appropriate child care environments for all children, including children with special needs, and their families.

Through the *Healthy Child Care Missouri* program, the Department of Health funds 101 local health agencies across the state to provide consultation services/education regarding health and safety issues to child care providers, children and families of children in care. Local health agency nurses and other health consultants link caregivers and families to primary care providers and other health and social service programs, including Medicaid, First Steps, child care resource and referral agencies, child care licensing staff, WIC and many other state and local resources.

Local health agency health consultants may provide clarification about a child care provider's health and safety policies and procedures, especially policies related to child illnesses and communicable disease outbreaks, or specific health and safety issues. On-site consultation may include identification of health and safety risks, review of children's immunization records, or implementation of infection control procedures. A one-hour assessment may lead to a health promotion and injury prevention workshop. Using videotaped and printed resources, nurse consultants are able to help caregivers identify possible signs and symptoms of illness, practice basic first aid and access local resources.

Local health agency nurse consultants will contact child care providers to determine the provider's interest in consultation services. However, many child care licensing staff, child care resource and referral agencies, parents and other caregivers also refer child care providers to the nurse consultants in their area. *Healthy Child Care Missouri* also encourages physicians and other primary care providers to refer families and child care providers to nurse consultants when they become aware of communicable disease concerns in the community that may impact the safety or health of children.

During the year ending September 30, 1997, over 4,000 hours of consultation services/education were provided to child care providers, children and their families. *Healthy Child Care Missouri* consultation services/education are provided free of charge.

If you would like more information about *Healthy Child Care Missouri* or the name of the nurse consultant in your area, please contact the Missouri Department of Health, Bureau of Nutrition and Child Care Programs at (573) 526-5344.

Tuberculosis Awareness Fortnight

March 8–21, 1998

Each year the American Lung Associations of Eastern and Western Missouri, along with the Missouri Department of Health, Bureau of Tuberculosis Control, co-sponsor Tuberculosis Awareness Fortnight.

Physicians and health care providers are encouraged to participate by providing displays, educational materials and lectures to staff and clients on the importance of tuberculosis screening, prevention and treatment.

Activities for Tuberculosis Awareness Fortnight are being planned. If you are interested in participating in these activities, or to obtain additional information or literature on tuberculosis, please contact:

American Lung Associations
of Eastern and Western Missouri
(800) LUNG-USA
or
Bureau of Tuberculosis Control
(573) 751-6122

Food Recalls—What Do They Mean to You?

David Stull
Environmental Public Health

From January 1 thru October 31,1997, there were 12 food product recalls in Missouri. The recalled products were found to be contaminated with such disease causing organisms as Norwalk virus, hepatitis A virus, *Salmonella*, *Cyclospora*, *Listeria monocytogenes* and *E. coli* O157:H7. There was one recall involving a mislabeled product that contained undeclared digitalis.

To evaluate what a food recall means in the way of risk of exposure to the population at large, it is beneficial to understand how the recall system works. Generally, recalls are voluntary and are initiated by the manufacturer of the involved food product either as a result of their own product testing, a customer complaint or testing done by a regulatory agency.

Federal agencies such as the Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA) are charged with classifying and monitoring recalls. Both FDA and USDA utilize a three class system in recalling products. Although the wording in their classifications are not identical, they are very similar and are summarized together below.

Class 1 Recall: A situation in which there is a reasonable probability that the use of, or exposure to, the recalled product will cause serious adverse health consequences or death.

Class 2 Recall: A situation in which use of, or exposure to, the recalled product may cause temporary or medically reversible adverse health consequences, or where the probability of serious adverse health consequences is remote.

Class 3 Recall: A situation in which use of, or exposure to, the recalled product is not likely to cause adverse health consequences, but is in violation of a federal standard.

The objective of a recall is to limit the exposure of the public to any violative product as quickly as possible by removing the product from retail sale and distribution, informing the public of the recall so that previously purchased product will not be consumed, and notifying the general public and medical community of the possible health effects if the product is consumed.

If the efforts to recall the product have been determined to be ineffective by the federal agency monitoring the recall, it has several options at its disposal. It can reclassify the recall, ask for assistance from state regulatory agencies, and finally, take action through the federal courts. State regulatory agencies generally have legal authority to remove products from the market much quicker than federal agencies and often assist in federally monitored recalls.

Although each recall situation is unique, the general rule is that as the public health significance of the recall increases, so does the involvement of the regulatory agencies.

Class 1 Recalls can result in FDA and the Department of Health making contact with all known distribution centers and retail outlets with the necessary assistance of county and city health agencies to assure that the recalled product is being removed from the market place. In addition, press releases are issued, either by the involved manufacturer or the regulatory agencies, to inform the public on how to identify the product, proper disposition of the product and symptoms caused if the contaminating agent is consumed. Also, the medical community would receive special notification of possible exposures in their community and be requested to report known illnesses that could be associated with the contaminated products.

Class 2 Recalls can result in press releases to the public with the same type of information that would be given in a class 1 recall. Either FDA or the Department of Health would contact the manufacturer to determine the appropriateness of this action. Also, the Department of Health would provide local health agencies with all of the necessary information pertaining to the recall and would ask them to assist in checking known distributors and retail outlets to insure that the recalled product has been removed from the market.

Class 3 Recalls can result in as little action as a news release being sent to the appropriate news agencies and memos to the state and local regulatory agencies to make them aware of the recall. This allows the state and local regulatory agencies to answer questions from the public pertaining to the recall.

Presently, the effectiveness of a food recall depends largely on the company producing the contaminated product, how organized their distribution system is, and how dedicated they are to removing the recalled product from the market. A well-organized company with a dedication to quality assurance can have a suspected product removed from the market before the regulatory agencies have time to respond. They would also be making efforts to assure that consumers who may have purchased such products are being informed through the news media and other sources on how to identify the recalled product, what to do with the product and what the health effects may be if the product is consumed.

Regulatory agencies can and do take action to remove contaminated products from the market, but without the cooperation of the food industry, the number of people exposed to the contaminated product will be greater because of delays as the regulatory agencies struggle with communications,

(continued on page 11)

CDC and ATSDR Electronic Health Information Resources

Portions reprinted with permission from the Journal of Public Health Management and Practice, Summer 1996, Vol. 2, No. 3. Phone numbers and data access information have been updated as needed.

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) are national resources for both public health information and information retrieval tools. To help public health practitioners make better use of these resources, some of the more important information resources and information technology tools available from CDC are described. These tools make public health information accessible via computer and automated telephone systems and on electronic media (diskette and CD-ROM).

This listing is not all-inclusive, but rather it highlights those systems that were judged to be of most general use to the health officer. The potential user of these systems must be forewarned that most of these systems are not integrated with each other, nor do they share common interfaces or data standards.[1] CDC is aware of this problem and is currently working hard to streamline and coordinate its technology efforts.

Information Available by Telephone or Fax

CDC Voice Information System

The CDC Voice Information System (VIS) provides telephone access to hundreds of prerecorded messages on subjects such as AIDS, immunization, hepatitis, chronic fatigue syndrome, Lyme disease and injuries (to name just a few). There is a special section of information for travelers. The injury choice has a section on obtaining grants.

Hundreds of documents can be "faxed back" to the caller (callers enter their fax number using a touch-tone telephone). Callers may request up to five documents at a time; certain documents can be mailed. Most of the documents are written for the lay public.

There is often information on late-breaking news (e.g., outbreaks). Some choices offer the option of being transferred to a CDC professional who can answer more specific questions.

Obtaining access:
Disease and Risk Information:
(888) 232-3228 (toll free—voice and fax)
(888) 232-3299 (toll free—fax only)
Travel Recommendations:
(404) 332-4559 (voice and fax)
(404) 332-4565 (fax only)
Required equipment:
Touch-tone telephone; access to long distance line.
Cost:
None, except for long distance charges; there is no charge for documents faxed or mailed to users.

National Institute for Occupational Safety and Health (NIOSH) Information System

The NIOSH Information System provides telephone access to ordering information on NIOSH publications and databases (including the *Pocket Guide to Chemical Hazards*, *Manual of Analytical Methods*, NIOSHTIC® and RTECS® [the databases are discussed separately in the text that follows]); prerecorded information on timely topics such as indoor air quality, carpal tunnel syndrome, homicide in the workplace and so on; information about NIOSH training materials, including videos; information on obtaining NIOSH grants; and an explanation on how to request a NIOSH investigation of workplace hazards. There is also the option of being transferred to a CDC professional who can answer more specific questions. Unlike the CDC VIS described previously, much of this information is targeted at public health professionals, although some of the material is intended to provide the general public with access to NIOSH information.

Obtaining access:
(800) 356-4674
Required equipment:
Touch-tone telephone; access to long distance line.
Cost: None

Information Available on CD-ROM and Diskettes

CDC Prevention Guidelines Database (PGDB)

The CDC Prevention Guidelines Database* (on diskette and CD-ROM) contains all of CDC's officially cleared recommendations and guidelines for the prevention of disease, injury and disability, and many of CDC's guidelines for public health practices. The material for this database was assembled in a cooperative project by liaisons in all of CDC's centers, institutes and offices, under the guidance of a steering committee.

The PGDB contains over 400 prevention guidelines documents. About two-thirds of these documents were originally published in the *Morbidity and Mortality Weekly Report* (MMWR); the rest were published as CDC monographs, brochures, book chapters and peer-reviewed journal articles. Most of the articles are relatively short; some (such as *Health Information for International Travel 1994* and *Youth Suicide Prevention Programs: A Resource Guide*) are book length. Although the main PGDB at CDC is updated weekly, the CD-ROM/diskettes version is published quarterly.

Obtaining access:
Contact Division of Public Health Systems, CDC at (800) 638-0672. The PGDB may also be accessed via CDC WONDER (described below).
Required equipment:
DOS-based desktop computer and Microsoft *Windows*; a CD-ROM drive is required for the CD-ROM version.
Cost:
$49.95 for initial dataset; there is a small charge every year for updates

* The CDC Prevention Guidelines Database is now available via Internet at http://aepo-xdv-www.epo.cdc.gov/wonder/prevguid/prevguid.htm.

Chronic Disease Prevention File

The Chronic Disease Prevention (CDP) File** (CD-ROM version) contains six comprehensive bibliographic datasets:

- **Health Promotion and Education Dataset**—contains over 25,000 bibliographic citations and abstracts focusing on disease prevention and health promotion, including program information;
- **Comprehensive School Health Dataset**—contains citations and abstracts focusing on various aspects of comprehensive school health programs. A core component of the dataset includes information on resources for human immunodeficiency virus (HIV) prevention education;
- **Cancer Prevention and Control Dataset**—contains entries emphasizing the application of effective breast, cervical and skin cancer early detection and control program activities and risk reduction efforts;
- **Prenatal Smoking Cessation Dataset**—contains information on the application of effective prenatal smoking cessation program activities and risk reduction efforts;
- **Epilepsy Education and Prevention Activities Dataset**—contains entries emphasizing the application of effective epilepsy early detection and control program activities, education and prevention efforts; and
- **Smoking and Health Dataset**—includes bibliographic references and abstracts of scientific and technical literature about smoking and tobacco use.

A CDP directory listing key contacts and organizations in areas of chronic disease prevention (such as nutrition and cancer) is also included.

Obtaining access:
The CDP File CD-ROM is available on a paid, annual subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; Ph: (202) 512-1800. It is updated every six months. The order number for the CDP File is 717-145-00000-3. (Note: there is also at least one site in each state where health professionals and educators can search the CDP File.***) In addition, the CDP File may also be accessed via CDC WONDER [discussed later]. For more information, contact the Technical Information and Editorial Services Branch, National Center for Chronic Disease Prevention and Health Promotion, CDC at (770) 488-5080.

Required equipment:
DOS-based desktop computer with a CD-ROM drive

Cost: $44 annually

Health, United States

Health, United States (on diskette) contains the annual report of the President and Congress on the health of the nation. There are data on mortality, morbidity, hospitalizations and so on, largely at the national and state levels. It is available as either spreadsheet files of the tables only, or a more enhanced version that uses a text viewer to provide access to text, charts and tables.

Obtaining access:
Contact the Data Dissemination Branch, National Center for Health Statistics, CDC at (301) 436-6154.

Required equipment:
DOS-based desktop computer and software that can read Lotus files (for spreadsheet version); or desktop computer with Microsoft *Windows* 3.0 or higher (for text viewer version)

Cost:
$15 to $55 (spreadsheet version); $27 to $90 (text viewer version); costs vary by vendor (as do accepted forms of payment and delivery time)

NIOSHTIC®

NIOSHTIC® is the National Institute of Occupational Safety and Health's electronic, bibliographic database of literature in the field of occupational safety and health that is updated quarterly. About 160 current, English language technical journals provide approximately 35 percent of the additions to NIOSHTIC® annually. Retrospective information (some from the 19th century) is also acquired and entered. It includes information on behavioral sciences; biochemistry, physiology and metabolism; toxicology; pathology and histology; chemistry; control technology; education and training; epidemiological studies of diseases and disorders; ergonomics; health physics; occupational medicine; safety; and hazardous waste.

Obtaining access:
NIOSHTIC® is available on CD-ROM from several commercial vendors. For information about vendors of all NIOSH electronic products, call (800) 356-4674; there is an option to speak directly with a NIOSH information specialist. Or, write to NIOSH, 4676 Columbia Parkway (C-13), Cincinnati, OH 45226; FAX: (513) 533-8573; E-mail: pubstaft @cdc.gov.

Required equipment:
DOS-based desktop computer and a CD-ROM drive

Cost:
$250 to $950 (the software varies by vendor [who set costs], and other databases are sometimes packaged with NIOSHTIC®)

RTECS®

RTECS® is the Registry of Toxic Effects of Chemical Substances. It is a database of toxicological information compiled, maintained and updated by NIOSH. It represents NIOSH's efforts to list all known toxic substances and the concentrations at which toxicity is known to occur. It contains data on over 130,000 chemicals, abstracted from the open scientific literature.

Obtaining access:
RTECS® on CD-ROM may be acquired from several commercial vendors. For information about vendors of all NIOSH electronic products, call (800) 356-4674; or write to NIOSH, 4676 Columbia Parkway (C-13), Cincinnati, OH 45226; FAX: (513) 533-8573; E-mail: pubstaft @cdc.gov.

Required equipment:
DOS-based desktop computer and a CD-ROM drive

Cost:
$250 to $2,000 (the software varies by vendor [who sets cost], and other databases are sometimes packaged with RTECS®)

(continued on page 6)

**The Chronic Disease Prevention File is now available via Internet as part of the Combined Health Information Database (CHID) at http://chid.nih.gov (described on page 9).

*** The following sites in Missouri have a copy of the CDP File CD-ROM and are willing to allow access to that file:

Division of Chronic Disease Prevention and Health Promotion, Missouri Department of Health, 101 Park DeVille Drive, Columbia, MO 65203. Contact Jeannette Jackson-Thompson at (573) 876-3283.

Epilepsy Foundation for the Heart of America, 6550 Troost, Kansas City, MO 64131. Contact Trish Miller at (816) 444-2800.

Epilepsy Foundation of the St. Louis Region, 7100 Oakland Avenue, St. Louis, MO 63117. Contact Kathleen Kaiman at (314) 645-6969.

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Toxicological Profiles

ATSDR's Toxicological Profiles[§] (CD-ROM) consist of all final ATSDR toxicological profiles, which are extensively peer-reviewed, covering the toxicological effects of hazardous substances, chemicals and compounds. It contains more than 14,000 pages worth of comprehensive, up-to-date data on the mitigation of health effects, all available health data and data gaps. Each profile includes an examination, summary and interpretation of available toxicological and epidemiological data evaluations of the hazardous substance, including environmental fate; and a determination of the levels of significant human exposure for the substance and the associated acute, intermediate and chronic health effects. It is fully indexed and can be searched easily (including across profiles).

Obtaining access:
Order from CRC Press Inc., 2000 Corporate Blvd., NW, Boca Raton, FL 33431; Ph: (800) 272-7737 or FAX: (800) 374-3401.

Required equipment:
DOS-based desktop computer with Microsoft *Windows* and CD-ROM drive

Cost: $125

Information Available by Modem

CDC National AIDS Clearinghouse ONLINE

CDC NAC ONLINE is the computerized information network of the CDC National AIDS Clearinghouse (CDC NAC). It is designed for nonprofit AIDS-related organizations and other HIV/AIDS professionals. Users must be granted access by CDC NAC staff. Users include CDC and Public Health Service staff, other health administrators, universities, community-based organizations, health educators and service providers. CDC NAC ONLINE contains the latest news and announcements about AIDS- and HIV-related issues, including prevention and education campaigns, treatment and clinical trials, legislation and regulations and upcoming events.

CDC NAC ONLINE provides direct access to CDC clearinghouse text databases such as the Resources and Services Database of organizations providing AIDS-related services. The system also features electronic mail and interactive bulletin board forums, and it is the original source of the *AIDS Daily Summaries* newsclipping service.

Obtaining access:
Contact CDC NAC, P.O. Box 6003, Rockville, MD 20849-6003; Ph: (800) 458-5231; TDD: (800) 243-7012; FAX: (301) 738-6616

Required equipment:
DOS-based Macintosh or desktop computer with a modem (CDC NAC provides the software)

Cost:
Software and access are provided free of charge to nonprofit AIDS-related organizations and other authorized HIV/AIDS professionals.

CDC WONDER

CDC WONDER, an information and communication system developed by CDC specifically for public health, provides access to a wide variety of reports, including CDC publications (title, author, abstract) and other bibliographies; the Chronic Disease Prevention bibliographic files; the Healthy People 2000 objectives and associated data sources; all of CDC's official prevention guidelines; a calendar of public health training courses and resources at CDC and elsewhere; CDC's *Emerging Infectious Diseases* journal (described below); and advisories for overseas travelers.[1–3]

The full text of the MMWR (1982 to present) is searchable on-line. MMWR articles may be downloaded in full, and (for MMWR article since September 1993) figures and tables are included in downloaded articles. There is also a listing of CDC experts by their area of specialization.

CDC WONDER's Info Exchange is a special bulletin board-like database for posting and exchanging materials among CDC staff and the 16,000 registered CDC WONDER users in health departments, schools of public health and medicine, laboratories, clinician's offices and elsewhere. All requested documents are automatically downloaded for printing or inclusion in other materials.

Obtaining access:
Currently, the CDC WONDER Internet site is the only place to obtain the software. CDC WONDER Support staff are directing all their efforts toward developing this site. The present plan is to support PC WONDER through December 1999, then discontinue support. After that, CDC WONDER will only be available through the Internet site. (Software may be obtained from a colleague; there are no restrictions on duplication. However, each user needs his or her own account.)

Required equipment:
DOS-based desktop computer and a modem.

Cost:
CDC WONDER software can be downloaded free of charge from the CDC WONDER Internet site at http://wonder.cdc.gov. Employees of state and local health departments may obtain an account (not software or manuals) free of charge by mailing (not faxing) a CDC WONDER user registration form, and a letter on official health department stationery to CDC WONDER User Support, 1600 Clifton Road, Mail Stop C-08, Atlanta, GA 30333 Ph: (888) 496-8347, FAX: (404) 639-4662. The letter should state that, as an employee of the health department, they are requesting that CDC provide a CDC WONDER User ID at no charge. Health department staff who receive an account this way will need to acquire a copy of the software and documentation from a colleague on download from the CDC WONDER Internet site.

NIOSHTIC®

NIOSHTIC® (described previously) is also available on-line.

Obtaining access:
NIOSHTIC® is accessible on-line from several commercial vendors. (Those who cannot access NIOSHTIC® through the NIOSH-listed commercial sources may still have the search performed by a public library or an information broker/computer search service.) For information about vendors of all NIOSH electronic products, call (800) 356-4674; or write to NIOSH, 4676 Columbia Parkway (C-13), Cincinnati, OH 45226; FAX: (513) 533-8573; E-mail: pubstaft@cdc.gov.

Required equipment:
DOS-based desktop computer, a modem and basic telecommunications software.

Cost:
On-line prices range from $30 to $60 per connect hour plus print charges. NIOSH does not set prices; vendors should be contacted directly for price information.

[§] ATSDR's Toxicological Profiles are now available via Internet at http://atsdr1.atsdr. cdc.gov:8080/gsql/toxprof.script.

RTECS®

RTECS® (described previously) is also available on-line.

Obtaining access:
RTECS® is accessible on-line from several commercial vendors. For information about vendors of all NIOSH electronic products, call (800) 356-4674; there is a direct option as well as an opportunity to speak with a NIOSH information specialist, Or, write to NIOSH, 4676 Columbia Parkway (C-13), Cincinnati, OH 45226; FAX: (513) 533-8573; E-mail: pubstaft @cdc.gov.
Required equipment:
DOS-based desktop computer, a modem and basic telecommunications software
Cost:
On-line prices range from $30 to $60 per connect hour, plus print charges. NIOSH does not set prices; vendors should be contacted directly for price information.

Information Available via the Internet

CDC Home Page

The CDC Home Page on the Internet provides detailed information on CDC programs; access to CDC information resources such as CDC WONDER, *Emerging Infectious Diseases*, HazDat, and the MMWR (described below); and pointers to other public health resources on the Internet, including servers at the Department of Health and Human Services, the National Library of Medicine and the World Health Organization. There is also an FTP (file transfer protocol for the Internet) service for obtaining documents, including selections from Emerging Infectious Diseases, the MMWR, tuberculosis recommendations and rating of the inspection records of cruise ships.

Obtaining access:
http://www.cdc.gov
ftp://ftp.cdc.gov
Required equipment:
Access to the Internet and a Web browser
Cost: None

CDC NAC Internet Services

The CDC NAC Internet Services provides access to the *AIDS Daily Summary*, AIDS-related MMWR articles; tables from CDC's HIV/AIDS Surveillance Report and other CDC documents, as well as information about prevention, treatment and living with HIV.

Obtaining access:
http://www.cdcnac.org
gopher://gopher.niaid.nih.gov:70/11/aids/cdcnac
ftp://cdcnac.org
You can subscribe to an electronic mail listing of files, press releases and so forth through the Internet site.
Required equipment:
Access to the Internet and a Web browser (or just access to Internet mail to receive mailings)
Cost: None

CDC WONDER

CDC WONDER via the Internet provides the same data that are available in CDC WONDER by modem (see previous description). Because this system allows the submission of ad hoc database queries, the user may be required to complete a "request" and await a "response" (or receive a response via electronic mail).

Obtaining access:
http://wonder.cdc.gov
Required equipment:
Access to the Internet and a Web browser
Cost: None

Emerging Infectious Diseases

Emerging Infectious Diseases (EID) is a quarterly peer-reviewed journal distributed on the Internet. Its goals are to promote the recognition of new and re-emerging infectious diseases and to improve the understanding of factors involved in disease emergence, prevention and elimination. EID has an international scope and is intended for professionals in infectious diseases and related sciences. It is divided into three sections:

- **Perspectives**—A section addressing factors that underlie disease emergence, including microbial adaptation and change, human demographics and behavior, technology and industry, economic development and land use, international travel and commerce and breakdown of public health measures.
- **Synopses**—Concise, state-of-the-art summaries of specific diseases or syndromes and related emerging infectious disease issues.
- **Dispatches**—Brief laboratory or epidemiologic reports with an international scope.

Obtaining access:
http://www.cdc.gov/ncidod/EID/eid.htm (or from CDC Home Page)
ftp://ftp.cdc.gov/pub/EID
Required equipment:
Access to the Internet and a Web browser
Cost: None

HazDat

HazDat (Hazardous Substance Release/Health Effects Database) contains information on the release of hazardous substances from Superfund sites and emergency events, including information on site characteristics, contaminants found, impact on population, community health concerns, ATSDR recommendations, environmental fate of hazardous substances, exposure routes and physical hazards at the site/event. HazDat also contains substance-specific information, such as the ATSDR Priority List of Hazardous Substances, health effects by route and duration of exposure, metabolites, interactions of substances, susceptible populations and biomarkers of exposure and effects. There are hundreds of lengthy, detailed entries that can be searched by single words. Access to Internet is required for use.

Obtaining access:
http://atsdr1.atsdr.cdc.gov:8080/hazdat.html
Required equipment:
Access to the Internet and a Web browser
Cost: None

Morbidity and Mortality Weekly Report (MMWR)

The MMWR contains brief articles on timely issues and provisional notifiable disease data, based on weekly reports to CDC by state health departments. (The reporting week concludes at close of business on Friday; data compiled nationally are released to the public on the succeeding Friday.) Current issues and some back issues and selected associated publications (Report and Recommendations, Surveillance Summaries) are available for downloading from a Web server. The files are in Adobe Acrobat format (the viewer is available for downloading). Typical

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issues are 250 to 400 Kbytes, but summaries are available on-line.

Obtaining access:
http://www.cdc.gov/epo/mmwr/mmwr.html (or from the CDC Home Page)
gopher://cwis.usc.edu:70/11/The_Health_Sciences_Campus/Periodicals/mmwr
ftp://ftp.cdc.gov/pub/Publications/mmwr
To receive a weekly table of contents and announcements, send electronic mail to listserv@listserv.cdc.gov, with SUBSCRIBE MMWR-TOC as the message.

Required equipment:
Access to the Internet and a Web browser (or just access to Internet mail to receive the MMWR electronically mailed)

Cost: None

Electronic Data Available on CD-ROM and Diskettes

AIDS Public Information Data Set

The AIDS Public Information Data Set (on diskette) contains summary surveillance data on the AIDS epidemic in the United States. The dataset has two components. The first is a file with one record per patient diagnosed and reported with AIDS. These records contain basic demographic, clinical and HIV transmission risk information. This component is best used for analyzing trends and characteristics of the AIDS epidemic at the national level. The patient-level file can be exported in either ASCII or dBASE compatible format for analysis. The second component is a set of predefined tables that contains much of the information available on the patient-level dataset together with geographic identifiers (state and metropolitan statistical area). This component is most appropriate for analysis of data at the state and local levels. Software for viewing, printing and exporting the data and tables is included.

Obtaining access:
CDC National AIDS Clearinghouse, P.O. Box 6003, Rockville, MD 20849-6003; Ph: (800) 458-5231; TDD: (800) 243-7012; request inventory number #D206

Required equipment:
DOS-based desktop computer

Cost: None

Behavioral Risk Factor Surveillance System (BRFSS)

Data from the BRFSS (1984–93 on CD-ROM) contains prevalence information on state level risk factors for chronic diseases, including smoking, drinking alcohol, seat belt usage and so forth. Included software facilitates exploratory analysis and mapping. An updated CD-ROM, including 1994 data, standardized geocoding and additional documentation, became available in late 1995.

Obtaining access:
Contact Division of Adolescent and School Health, CDC at (770) 488-3259.

Required equipment:
DOS-based desktop computer and a CD-ROM drive

Cost: To be determined

National Center for Health Statistics (NCHS) Data Files

NCHS data files (on CD-ROM) are available for: the National Health Interview Survey (1988–92); the National Ambulatory Care Survey (1990); the National Hospital Discharge Survey (1990); the Longitudinal Study of Aging (1984–90); and the Live Birth/Infant Death files (1985–88). These data are accessed via the *Statistical Export and Tabulation System* (SETS), a software program written by NCHS to provide a query interface to national data and dataset documentation on CD-ROMs or diskettes that will allow public health practitioners to make wide use of the benefits of the information age.

Obtaining access:
For ordering information, contact the Data Dissemination Branch, NCHS, CDC Presidential Building, Room 1064, 6525 Belcrest Road, Hyattsville, MD 20782; Ph: (301) 436-8500; or address electronic mail to sets@nch10a.em.cdc.gov

Required equipment:
DOS-based desktop computer with CD-ROM drive

Cost: $15 to $30

Electronic Data Available by Modem and Internet

CDC WONDER

CDC WONDER via modem provides access to data on mortality, natality, population, cancer incidence, motor vehicle and occupational injuries, hospitalizations, AIDS and other sexually transmitted diseases and many other numeric datasets. Results are downloaded to the user's microcomputer where, using integrated software supplied with the system, results can be viewed, tabulated, graphed and printed; or exported for editing, inclusion in other documents, or analysis in specialized statistical software. Most queries take one to two minutes.[2,3] Data are derived from standard public use files, or data prepared especially for CDC WONDER from existing data. The databases and associated reports are developed cooperatively with data providers who add information to the system. Each dataset has on-line documentation (i.e., information on how the data were collected, the phrasing of the question on a questionnaire, sampling methods, known biases and errors, and references). New data are added regularly.

CDC WONDER via the Internet provides access to much of the same data that are available in CDC WONDER via modem. Tabulating and graphing will require the user to download *CDC WONDER Tables and Graphs*, which is the no-cost, DOS-based software built into the CDC WONDER DOS client. Alternatively, users may use their own software for this purpose; *CDC WONDER Tables and Graphs* has an export module to facilitate conversions to any one of 10 common formats.

Obtaining access:
Currently, the CDC WONDER Internet site is the only place to obtain the software. CDC WONDER Support staff are directing all their efforts toward developing this site. The present plan is to support PC WONDER through December 1999, then discontinue support. After that, CDC WONDER will only be available through the Internet site. (Software may be obtained from a colleague; there are no restrictions on duplication. However, each user needs his or her own account.)

Internet access is available at http://wonder.cdc.gov

Required equipment:
DOS-based desktop computer and a modem. Internet access and a Web browser are necessary for Internet access.

Cost:

CDC WONDER software can be downloaded free of charge from the CDC WONDER Internet site at http://wonder.cdc.gov. Employees of state and local health departments may obtain an account (not software or manuals) free of charge by mailing (not faxing) a CDC WONDER user registration form, and a letter on official health department stationery to CDC WONDER User Support, 1600 Clifton Road, Mail Stop C-08, Atlanta, GA 30333 Ph: (888) 496-8347, FAX: (404) 639-4662. The letter should state that, as an employee of the health department, they are requesting that CDC provide a CDC WONDER User ID at no charge. Health department staff who receive an account this way will need to acquire a copy of the software and documentation from a colleague on download from the CDC WONDER Internet site.

There is no charge for Internet access.

REFERENCES

1. Friede A, McDonald MC, Blum H. Public health informatics: How information-age technology can strengthen public health. Annu Rev Public Health 1995;16:239–52.
2. Friede A, Reid JA, Ory HW. CDC WONDER: A comprehensive online public health information system of the Centers of Disease Control and Prevention. Am J Public Health 1993;83:1289–94.
3. Friede A, Rosen DR, Reid JA. CDC WONDER/PC: Cooperative processing for public health informatics. J Am Med Inform Assoc 1994;1:303–12.

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Jul 97	Aug 97	Total YTD
Specimens Tested	11,257	10,573	81,972
Initial (percent)	63.4%	63.4%	51,598
Repeat (percent)	36.6%	36.6%	30,374
Specimens: Unsatisfactory	175	164	1,244
HT Borderline	1,153	1,226	10,556
HT Presumptive	33	38	543
PKU Borderline	8	4	46
PKU Presumptive Positive	0	2	7
GAL Borderline	67	112	884
GAL Presumptive Positive	3	3	13
FAS (Sickle cell trait)	95	70	615
FAC (Hb C trait)	21	22	186
FAX (Hb variant)	16	17	110
FS (Sickle cell disease)	1	0	13
FSC (Sickle C disease)	2	1	8
FC (Hb C disease)	0	1	2

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Editorial Note: While updating the phone numbers and access sites for the above article, I discovered the following health information database:

The Combined Health Information Database (CHID)

CHID is a database produced by health-related agencies of the federal government. This database provides titles, abstracts and availability information for health information and health education resources. CHID can be accessed at http://chid.nih.gov.

The value of this database is that it lists a wealth of health promotion and education materials and program descriptions that are not indexed elsewhere. New records are added quarterly and current listings are checked regularly to help ensure that all entries are up to date and still available from their original sources. Some older records are retained for archival purposes.

CHID is updated four times a year. The updated database is available by the end of these months: January, April, July and October.

At present, there are 18 topics on CHID. When searching CHID, you can search either individual topics or the entire database. The topics are:

- AIDS Education
- Alzheimer's Disease
- Arthritis and Musculoskeletal and Skin Diseases
- Cancer Patient Education
- Cancer Prevention and Control
- Comprehensive School Health
- Deafness and Communication Disorders
- Diabetes
- Digestive Diseases
- Disease Prevention/Health Promotion
- Epilepsy Education and Prevention
- Health Promotion and Education
- Kidney and Urologic Diseases
- Maternal and Child Health
- Medical Genetics and Rare Disorders
- Oral Health
- Prenatal Smoking Cessation
- Weight Control

HIV Postexposure Prophylaxis (PEP) Registry

The U.S. Public Health Service has recommended the use of antiretroviral agents as postexposure prophylaxis (PEP) after certain occupational exposures to HIV.* To collect information about the safety and outcome of taking antiretroviral drugs for postexposure prophylaxis, the Centers for Disease Control and Prevention (CDC), Glaxo Wellcome Inc. and Merck & Co. have established the HIV Postexposure Prophylaxis Registry.

What is the Registry?

The HIV Postexposure Prophylaxis (PEP) Registry is an important surveillance program designed to collect safety information on the use of antiretroviral drugs in non-HIV infected health-care workers who receive PEP for occupational HIV exposure.

Why is the Registry Important?

Much remains to be learned about the management of exposure to HIV. Except for zidovudine, there is very little information on the use, toxicity and benefits of antiretroviral drugs in persons not infected with HIV. By collecting information on occupational HIV PEP, this registry will gather data which will help clarify the safety and benefit of PEP use.

How to Participate in the Registry

Health-care providers who prescribe HIV PEP to health-care workers for occupational HIV exposures are encouraged to contact the registry. The information requested by the registry is likely to be collected as part of the usual management of occupational HIV exposure; additional visits or laboratory work is not expected. Information is obtained at the beginning of treatment, after completion of treatment and six months after the exposure. Health-care worker participation is voluntary and confidential.

For more information contact:

The HIV PEP Registry
1410 Commonwealth Drive, Suite 215
Wilmington, NC 28405

Toll-free telephone:
(888) PEP-4HIV or (888) 737-4448
8:30 a.m.–5:30 p.m. EST
Pager coverage after-hours

Toll-free fax:
(800) 800-1052
Available 24 hours

* For complete information about current recommendations, see "Update: Provisional Public Health Service recommendations for chemoprophylaxis after occupational exposure to HIV," MMWR 1996;45:468-72. Copies are available from the National AIDS Clearinghouse at (800) 458-5231. These recommendations were reprinted in the May–June 1996 edition of the Missouri Epidemiologist.

The recommendations are also available on the Internet at:
http://aepo-xdv-www.epo.cdc.gov/wonder/prevguid/m0042200/m0042200.htm

Further information on prevention and management of occupational exposures is available from CDC's Hospital Infections Program at:
http://www.cdc.gov/ncidod/hip/hip.htm

National Hotline Provides 24-Hour Consultation on Occupational Exposures to HIV and Other Blood Borne Pathogens

Health care workers are often exposed through occupational accidents to HIV or hepatitis and other blood borne diseases. Studies have found that prompt treatment for exposures can help to reduce the number of persons who actually become infected from these accidents.

A new 24-hour emergency hotline for clinicians who need advice on treating patients who have suffered occupational exposures to blood has opened to help provide prompt and appropriate treatment. The free hotline is open seven days a week by calling (888) HIV-4911 or (888) 448-4911.

The hotline, called the National Clinician's Post-Exposure Prophylaxis Hotline (PEPLine), is staffed by University of California–San Francisco (USCF) health care providers at San Francisco General Hospital. PEPLine offers the most current information on treatment (prophylaxis) for occupational exposures. Callers to PEPLine will receive immediate advice from physicians, clinical pharmacists or nurse practitioners. Non-emergency calls will be returned during business hours.

The PEPLine experts will help callers assess patient risks, discuss the current post-exposure prophylaxis protocols, and review specific treatment and follow-up options. Written materials expanding on the telephone discussion will be sent when needed. Protocols are also available on the internet at **http://epi-center.ucsf.edu.**

The PEPLine was created by combining resources from two existing UCSF programs—the National HIV Telephone Consultation Service (Warmline)¶ and the Needlestick Hotline.

¶ The Warmline at (800) 933-3413 is an additional free consultation service for health care providers caring for HIV-infected patients.

Co-director of the PEPLine, Julie L. Gerberding, M.D., M.P.H., who also developed the Needlestick Hotline, states, "recent studies suggest that prompt treatment can be critically important for many health care workers sustaining occupational exposures. Antiretroviral therapy is potentially a lifesaver. However, therapy should be started as soon as possible after an exposure. That's why the PEPLine can make a difference." (In addition, it is essential that all health care facilities, including medical offices and clinics, have in place a protocol, updated as necessary, for managing occupational exposures. Prophylactic antiretroviral drugs must be available at the facility, or else arrangements must be in place to obtain the drugs at a nearby facility, such as a hospital.)

The development of new antiretroviral drugs has given hope to HIV-infected persons and to exposed health care workers. However, these advances also mean that determining the most effective prophylaxis regimen can be difficult, especially as recommendations change over time. The PEPLine will ensure that state-of-the-art knowledge is available to all health professionals providing care to individuals who have suffered occupational exposures.

PEPLine is funded by the Health Resources and Services Administration (HRSA) and the Centers for Disease Control and Prevention (CDC), in collaboration with the San Francisco Department of Health and UCSF.

Food Recalls

(continued from page 3)
limited resources and finding product distribution routes.

In summary, you should know that the number of food recalls is increasing. As our population ages and the number of immunocompromised individuals increases, the number of people who will experience severe symptoms from a contaminated food product will also increase. Therefore, being familiar with the symptoms associated with the organism or agent of a recalled food product will lead to a quicker treatment for some individuals and provide information to regulatory agencies that could prevent additional unnecessary exposures to such product.

VIDEOCONFERENCES IN 1998

The Bureau of Immunization will sponsor the following Centers for Disease Control and Prevention satellite broadcasts during 1998:

Vaccine Safety and Risk Communication
February 26, 1998

Epidemiology & Prevention of Vaccine-Preventable Diseases
April 9, 16, 23 & 30, 1998 (4-day course)

Adult Immunization Update
June 4, 1998

Immunization Update 1998
September 10, 1998

Adult Immunization: Strategies That Work
October 8, 1998

These live, interactive satellite videoconferences feature question and answer sessions in which participants nationwide can address questions to the course instructors on toll-free telephone lines. Target audiences include: physicians, nurses, sanitarians, infection control practitioners, laboratorians, epidemiologists, disease reporters and others who are involved in the surveillance and reporting of vaccine-preventable diseases.

For more information about the courses or for site locations in Missouri, contact the immunization representative in your district health office or the Bureau of Immunization at (573) 751-6133.

1996 Missouri Health Statistics

Wayne F. Schramm, M.A.
Bureau of Health Data Analysis

Final 1996 Missouri mortality statistics reveal a one-third decline in AIDS deaths from 502 in 1995 to 339 in 1996. The rate of AIDS mortality in 1996 (6.3 per 100,000 population) was the lowest in Missouri in six years.

Overall mortality data for Missouri shows a slight decrease of about one percent from 54,222 in 1995 to 53,766 in 1996. See Table 1. The life expectancy for Missourians increased from 75.3 years in 1995 to 75.5 years in 1996. This matches the 1992 Missouri record life expectancy. As Table 2 shows, life expectancies for Missouri men increased from 71.8 to 72.4 years in 1996; while for Missouri women, it decreased from 78.6 to 78.5 years. The 1996 male-female difference of 6.1 years is the smallest since the 1950s. The largest difference of 8.2 years occurred in 1976.

The three leading causes of death (heart, cancer and stroke) all decreased slightly in 1996, with cancer showing the largest decrease (2.5 percent). Deaths due to pneumonia and influenza, septicemia, homicide and liver disease also decreased in 1996. Contrarily, mortality increased for chronic obstructive pulmonary disease, unintentional injuries (accidents), diabetes, suicides and kidney disease (nephritis and nephrosis).

The decline in AIDS-related deaths in Missouri appears to reflect a national trend. The Centers for Disease Control and Prevention has reported that the national age-adjusted death rate from HIV/AIDS dropped an estimated 26 percent between 1995 and 1996, from 15.6 deaths per 100,000 population in 1995 to 11.6 in 1996. The decreased mortality in Missouri and elsewhere is believed to be related to improvements in medical care for persons with HIV disease, the increasing use of medicine to prevent the onset of infections and the use of combination therapy with antiretroviral agents (including protease inhibitors). However, Department of Health officials still stress the importance of prevention.

The decrease in the life expectancy advantages of women over men is reflected in the 2.6 percent decrease in male deaths in 1996 and 0.6 percent increase in female mortality. About one-fourth of the male decrease is due to the AIDS mortality decrease as over 90 percent of AIDS deaths in Missouri are in men. Another one-quarter of the male decrease is reflected in a three percent decrease in smoking-related deaths. Smoking-related deaths for females did not change in 1996. These differentials reflect smoking behavior changes by gender from 20 to 30 years ago. Forty percent of the male mortality decrease

Table 1. Leading Causes of Death, Missouri, 1986, 1995 and 1996.

Leading Causes of Death	1996 No.	1996 Rate*	1995 No.	1995 Rate*	1986 No.	1986 Rate*
Heart	18,174	339.1	18,335	344.7	18,114	360.5
Cancer	12,014	224.2	12,319	231.6	10,813	215.2
Lung Cancer	3,687	68.8	3,756	70.6	3,125	62.2
Stroke	3,866	72.1	3,937	74.0	3,612	71.9
Chronic Pulmonary Disease	2,516	46.9	2,447	46.0	1,913	38.1
Accidents	2,253	42.0	2,201	41.4	2,221	44.2
Motor Vehicle	1,145	21.4	1,102	20.7	1,140	22.7
Other	1,108	20.7	1,099	20.7	1,081	21.5
Pneumonia & Influenza	2,179	40.7	2,238	42.1	1,726	35.0
Diabetes	1,289	24.1	1,237	23.3	847	16.9
Suicide	768	14.3	726	13.6	728	14.5
Nephritis & Nephrosis	647	12.1	612	11.5	574	11.3
Septicemia	500	9.3	510	9.6	442	8.8
Homicide	476	8.9	482	9.1	487	9.7
Liver Disease	408	7.6	413	7.8	404	8.0
AIDS	339	6.3	502	9.4	63	1.3
Tuberculosis	18	0.3	23	0.4	36	0.7
Maternal Deaths	12	16.3**	12	16.5**	4	3.9**
Total Deaths	**53,766**	**10.0*** **	**54,222**	**10.2*** **	**49,971**	**10.6*** **
Population	5,359,000		5,319,000		5,024,000	

* per 100,000 population
** per 100,000 live births
*** per 1,000 population

was due to a three percent decrease in heart disease deaths.

Maternal and Child Health

Final 1996 Missouri vital statistics show a slight increase in infant mortality from 7.4 in 1995 to 7.6 per 1,000 live births in 1996. See Table 3. The 7.6 rate is the second lowest infant death rate ever recorded in Missouri (second only to the 1995 rate). Infant mortality increased slightly in St. Louis City, Kansas City and non-metro Missouri, while decreasing in St. Louis County.

The Missouri rate of inadequate prenatal care reached a record low in 1996 (12.0%) compared with 12.4 percent in 1995. The rate of low birth weight (less than 5.5 pounds) decreased slightly from 7.6 to 7.5 percent. The disparity between whites and African Americans decreased for inadequate prenatal care and low birth weight in 1996, but the disparity increased for infant mortality. In 1996, the ratio between the African-American and white rates was 2.9 for inadequate prenatal care, 2.0 for low birth weight and 2.5 for infant mortality.

As Table 4 shows, abortions increased 2.6 percent from 13,635 in 1995 to 13,989 in 1996 with the largest increase in the Kansas City area. Out-of-wedlock births increased in 1996 following two years of declines. After dropping by one-third from 1991 to 1995, the number of short spacing births (less than 18 months between births) increased 2.6 percent in 1996 to 4,413 from 4,301 the previous year. The total number of teen births (10,477) did not change substantially in 1996, but births to early teens (under 18) decreased by 2.4 percent, from 3,910 to 3,816.

Other maternal and child health indicators show the following:

- The rate of maternal smoking during pregnancy decreased from 20.0 percent in 1995 to 19.5 percent in 1996, the lowest rate ever reported.
- The numbers of women on Medicaid during their pregnancy remained about the same, (29,423 in 1996 compared with 29,318 in 1995).

(continued on page 14)

Table 2. Life Expectancies (Years) by Gender, Missouri, 1950–96.

Year	Male	Female	Difference
1950	65.6	71.3	5.7
1960	66.9	73.6	6.7
1970	66.8	74.7	7.9
1975	68.4	76.4	8.0
1980	69.9	77.6	7.7
1985	71.2	78.3	7.1
1990	71.7	78.9	7.2
1991	71.5	78.9	7.4
1992	71.8	79.1	7.3
1993	71.6	78.7	7.1
1994	71.7	78.6	6.9
1995	71.8	78.6	6.8
1996	72.4	78.5	6.1

Table 3. Maternal and Child Health Statistics, Missouri, 1986, 1995 and 1996.

	1996		1995		1986	
	No.	%	No.	%	No.	%
Infant Deaths	558	7.6	539	7.4	799	10.6
White	381	6.2	384	6.4	574	9.1
Black	175	15.8	150	13.7	218	19.1
Inadequate Prenatal Care	8,577	12.0	8,786	12.4	12,089	16.6
White	5,560	9.3	5,616	9.5	8,580	14.0
Black	2,763	26.8	2,964	28.5	3,332	30.9
Low Birth Weight	5,537	7.5	5,547	7.6	5,118	6.8
White	3,987	6.5	3,893	6.5	3,600	5.7
Black	1,426	12.9	1,546	14.1	1,461	12.8
Out-of-Wedlock Births	24,454	33.2	23,361	32.1	16,884	22.5
Teen (age 10–19) Live Births	10,477	14.2	10,487	14.4	10,101	13.4
Early Teen (age 10–17) Live Births	3,816	5.2	3,910	5.4	3,716	4.9
Smoking During Pregnancy	14,409	19.5	14,577	20.0	20,266	27.9
Medicaid Births	29,423	41.3	29,318	41.6	NA	NA
WIC Births	29,604	41.6	28,415	40.3	NA	NA
Food Stamp Births	15,146	21.3	15,567	22.1	NA	NA

Table 4. Resident Abortions, Births Spaced Less Than 18 Months Apart and Out-of-Wedlock Births by year, Missouri, 1989–96.

	Abortions		Births Spaced Less Than 18 Months Apart		Out-of-Wedlock Births	
	No.	Yearly Change	No.	Yearly Change	No.	Yearly Change
1989	18,639	--	5,979	--	21,105	--
1990	17,947	-3.7%	6,303	+5.4%	22,597	+7.1%
1991	17,171	-4.3%	6,480	+2.8%	23,673	+4.8%
1992	16,240	-5.4%	6,188	-4.5%	23,981	+1.3%
1993	15,415	-5.1%	5,677	-8.3%	24,320	+1.4%
1994	14,119	-8.4%	4,923	-13.3%	23,845	-2.0%
1995	13,635	-3.7%	4,301	-12.7%	23,361	-2.2%
1996	13,989	+2.6%	4,413	+2.6%	24,454	+4.7%

(continued from page 13)

- The number of women on the Supplemental Food Program for Women, Infants and Children (WIC) during their pregnancy increased by 4.2 percent from 28,415 in 1995 to 29,604 in 1996.
- Food stamp recipients during pregnancy (15,146) decreased by 2.7 percent in 1996.
- Maternal deaths in 1996 (12) matched the 1995 figure which was the highest number in 20 years. A large proportion of these deaths occurred to African-American women in the St. Louis area.

Communicable Diseases

Reports of early syphilis (primary, secondary, and early latent) cases decreased from 1,090 in 1995 to 480 in 1996, a 56 percent decrease. Reported cases of congenital syphilis decreased 73.9 percent from 46 in 1995 to 12 in 1996. These decreases are probably the results of increased follow-up resources devoted to the St. Louis metropolitan area and southeast Missouri.

Gonorrhea continues to decline with 8,414 cases reported in 1996 compared to 11,299 reported in 1995, a decrease of 25.5 percent.

A total of 11,935 cases of *Chlamydia trachomatis* infections were reported in 1996, a slight decrease from the 12,052 cases reported in 1995.

In 1996, 845 AIDS cases and 536 HIV cases were reported in Missouri residents. It is estimated there are currently 8,000 to 11,000 HIV-infected persons living in Missouri. From 1982 through 1996, a total of 7,181 AIDS cases have been reported; 4,126 (57.5%) of these individuals are known to have died.

Seventy-four cases of pertussis (whooping cough) were reported in 1996. This was an increase from 1995 in which there were 63 reported cases.

In 1996, three confirmed cases of measles were reported. This was an increase from 1995 when two confirmed cases of measles were reported.

One case of tetanus was reported in 1996 in an adult, compared to 1995 when 3 cases were reported.

No cases of rubella, diphtheria, polio, or *Haemophilus influenzae* type b (Hib) meningitis were reported in 1996.

Hepatitis A, at 1,414 cases, accounted for the largest proportion of the 5,124 communicable disease cases reported to the Bureau of Communicable Disease Control in 1996. This is an 18.4 percent reduction from the 6,444 diseases reported to the bureau in 1995.

Hepatitis A showed a geographic shift. Incidence decreased in the Northwestern Health District (mainly the Kansas City metropolitan area) from 742 cases in 1995 to 305 cases in 1996. In the Southwestern Health District, hepatitis A increased 395.3 percent from 127 cases reported in 1995 to 629 in 1996.

The largest decrease in incidence was in shigellosis with 387 cases reported in 1996, 66.0 percent below the 1,138 cases reported in 1995. This reversed an upward trend and is 42.6 percent below the five year median of 674 cases; the lowest it has been since 1991. The Eastern and Northwestern health districts showed the greatest reduction in the number of reported cases of shigellosis.

Hepatitis B cases declined from 437 cases in 1995 to 326 cases in 1996, continuing its downward trend since 1990. The 1996 incidence was 39.4 percent lower than the five-year median of 538 cases.

Meningococcal disease continues to increase in the state following a three-year trend. The disease has shifted from the southwest to the larger Kansas City and St. Louis metropolitan areas. The 1996 incidence of 57 cases is 54.1 percent above the five-year median of 37 cases.

For the second year in a row, Missouri's tuberculosis cases have declined. In 1996, 224 new tuberculosis cases were reported for a case rate of 4.2 per 100,000 population. This represents an 8.2 percent decrease from 1995 when 244 cases were reported.

While the number of tuberculosis cases in the non-metropolitan areas of Missouri decreased from 117 cases to 83, three out of the four major metropolitan areas showed increases in cases. Specifically, St. Louis City increased from 40 to 44 cases, Springfield-Greene County increased from 10 to 17 and Kansas City increased from 42 to 48.

Whites accounted for 52 percent of all reported tuberculosis cases in 1996 followed by African-Americans with 31 percent, Asians with 14 percent and Hispanics with 3 percent. The percentage of cases occurring among foreign born increased from 11 percent to 18 percent. The case rate for Asians was 62.1 per 100,000, followed by 12.0 for African Americans, 9.5 for Hispanics and 2.5 for whites.

Bureau of Communicable Disease Control Announces Two New Appointments

The Bureau of Communicable Disease Control in the Division of Environmental Health and Communicable Disease Prevention welcomes Mary Elizabeth (Liz) Kliethermes as the new Assistant Health Program Administrator for the Bureau of Communicable Disease Control. Liz is a registered nurse with managerial experience. As an employee with the Division of Aging for eight years, Liz served as a Facility Advisory Nurse within the Policy Unit of Institutional Services. In this capacity, she routinely taught the basics of infection control to new providers in long-term care facilities statewide. She also served as the liaison between providers and the Department of Health whenever communicable disease outbreaks occurred in long term care facilities. Liz holds a B.S. in accounting and business administration and has had experience in auditing both financial records and medical records. She has had a rich background in writing policy and working with legislative issues pertaining to long-term care.

Mrs. Kliethermes is responsible for providing consultation and assistance to the Communicable Disease Coordinators located in the six health districts in Missouri. She also coordinates influenza surveillance for Missouri. Liz is the bureau's representative to the division's financial unit on budget matters and fiscal notes. She also assists the Bureau Chief with legal issues, strategic planning and continuous quality improvement.

The bureau also welcomes Dr. Laura Hardin, a veterinarian and Ph.D. candidate in curriculum and instruction. Dr. Hardin holds a Masters of Science in veterinary epidemiology and has had experience in conducting research, applying for grants, writing articles for peer reviewed journals and teaching undergraduate and graduate students. Dr. Hardin joins the bureau as an Epidemiology Specialist. She will coordinate investigative work related to hepatitis A, B and C. Dr. Hardin is managing two hepatitis C seroprevalence studies at two mid-Missouri facilities and has assisted in implementing a hepatitis A vaccine demonstration project in Southwestern Health District. Dr. Hardin is also assisting with disease investigations and responses to calls about zoonotic diseases.

LATE BREAKERS

☞ The Department of Health's desire to strengthen public-private partnerships is being demonstrated with two projects that began November 18, 1997.

The first is financial support from Schering Corporation for a hepatitis C seroprevalence study in two mid-Missouri populations (one thought to be at high risk and one with moderate risk). Department of Health (DOH) staff will do risk assessment interviews with the patients who agree to blood testing, and will also provide data entry, data management and analysis. Schering is supporting the cost of the ELISA and RIBA tests on the blood specimens. A check for $20,000 was presented to DOH on Thursday, November 6, 1997. We appreciate Schering helping to estimate seroprevalence in these two populations. Because hepatitis C is considered a major unrecognized public health problem, we hope that future resources will enable DOH to manage a larger population-based study.

The second project is a hepatitis A vaccine intervention project in southwest Missouri. Because several counties within the Southwestern Health District met the Centers for Disease Control and Prevention (CDC) definition for intermediate rate of hepatitis A (50-200/100,000), these counties are eligible to receive vaccine through the Vaccines for Children (VFC) program. The intermediate rate counties are also eligible to receive hepatitis A pediatric vaccine from a supply of 90,160 single-dose vials donated from Smith, Kline, Beecham. Both the VFC and the donated vaccine will be used to immunize the pediatric and adolescent populations in these counties where the risk of transmission is highest. A comparison of hepatitis A incidence will be done for the age groups that receive high vaccine saturation (50-70%) and for those that do not. We hope this venture will enable us to contribute to the body of knowledge pertaining to the long-term prevention of hepatitis A in the 20–39 year old population and the control of community-wide hepatitis A outbreaks. We appreciate Smith, Kline, Beecham for their generosity in this demonstration project.

☞ Effective December 8, 1997, Howard Pue, D.V.M., M.S. was appointed Chief of the new Office of Surveillance in the Division of Environmental Health and Communicable Disease Prevention. Dr. Pue has recently retired from the U.S. Air Force where he served as a preventive medicine officer since 1983. More information on the new Office of Surveillance will be provided in a future issue of this newsletter.

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Marge Borst
Conference Coordinator
Bureau of Communicable Disease Control
Missouri Department of Health
930 Wildwood Drive
P.O. Box 570
JeffersonCity, MO 65102
Ph: (573) 751-6115
FAX: (573) 526-7810